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Redefining Burnout: Exploring Common Conceptualizations and the Neurophysiology of Chronic Stress to Establish an Integrated Allostatic Model

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CERTIFICATE OF APPROVAL

Clinical Research Project

This is to certify that the Clinical Research Project of

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Abstract

Burnout is a widely researched stress-related phenomenon associated with numerous adverse outcomes for employees and organizations. Unfortunately, burnout is not well understood and research to this point has been flawed due to a lack of consensus on the definition, dimensionality, and context of the construct. Prevalent conceptualizations of burnout have been criticized for being arbitrarily developed without solid theoretical foundation and for failing to clearly distinguish burnout from depression or other work-related conditions such as compassion fatigue, secondary traumatization, and vicarious traumatization. The current project first examines relevant literature to identify commonalities among prevalent burnout conceptualizations. Then relevant stress research is explored to identify possible neurophysiological explanations for the general presentation and progression of burnout. Finally, burnout and stress literature are integrated to create a definition and model of burnout that is non-arbitrary, theoretically driven, and that distinguishes burnout from depression and other work-related conditions. Findings of the project indicated that prevalent burnout conceptualizations share three elements: a resources-and-demands framework; domains related to the individual, interpersonal relationships, and external factors; and an underlying implication of a chronic stress process involved in the development, presentation, and progression of burnout. Exploration of stress research indicated that the neurophysiological process that occurs during adaptation to chronic stress, namely allostasis, accounts for the development, presentation, and progression of burnout, with depression being a potential outcome of the process. Clinical implications, limitations, and recommendations are discussed.

Keywords: burnout, chronic stress, allostasis, neurophysiology, appraisal, work, depression, compassion fatigue, secondary traumatization, vicarious traumatization

REDEFINING BURNOUT: EXPLORING COMMON CONCEPTUALIZATIONS AND THE NEUROPHYSIOLOGY OF CHRONIC STRESS TO ESTABLISH AN INTEGRATED ALLOSTATIC MODEL

DEDICATION

It is with enormous gratitude that I dedicate this work to my parents. They gave me the tools and perspectives that led me to this field and that allow me to be effective. They exposed me to a life of grey in a world of black and white. They showed me the complexity of people, the importance of finding the humanity in every person, and the responsibility we carry of preserving and honoring that humanity in ourselves and in others. They taught me to fight against the internal and external systems that work to dehumanize and separate us, long before I even knew that those systems existed or that they needed to be fought. While I deeply wish they could be here to see the person they helped grow, I carry their lessons and memories with me, planting seeds along the way.

This project is also dedicated to the many who have been influential in my professional and personal development. I am thankful for the profound impact they have had on my growth as a clinician and as a human being. To my FSPP family, who have shared this journey with me. It has been an honor to call them colleagues and friends. To my Ohio family, who inspired, encouraged, and cared for me. I could not have survived this without them. To my wife, Megan, who is my person, my best friend, and my soul mate. The love we share is infinite. Always and all ways. To my son, Leo, who is hilarious, empathic, and wise beyond his years. I may be his father, but he is the one that has given me the gift of life. To the rest of my chosen family, who have supported me persistently and unconditionally. I am blessed and grateful to have such a wealth of love.

Finally, I would like to dedicate this to myself. This is for my past self, who provides me insight and for my future self, who gives me hope. They have guided me to this conclusion and helped me to realize that this is just an introduction.

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CHAPTER I: INTRODUCTION

In 1961, Graham Greene published the book, *A Burnt-Out Case*, a novel about an internationally renowned architect who travels to Africa to escape the emptiness of his personal and professional life. During his journey down the Congo River, the man finds himself at a church-run leprosarium, where he meets the colony's only doctor. The doctor compares the man's loss of zeal to a "burnt-out case" of leprosy, in which the patient enters remission only because the disease is allowed to run its course, or "burn out," and they "lose everything that can be eaten away." Since Greene's writing, the term "burnout" has become more well-known for its application to individuals experiencing occupational distress. In a general sense, burnout has been characterized as a condition that results from chronic work-related stress (Maslach, Schaufeli, & Leiter, 2001). Burnout does not necessarily eat away at the flesh, but it does deplete the individual's physical and psychological energy (Maslach, 2003). In that regard, much like Greene's original reference, burnout could be thought of as a disease with the potential to consume the individual.

In recent years, burnout has arguably become one of the most widely discussed mental health issues and one of the more researched areas of psychology, with more than 1,000 journal articles related to burnout being published annually (Maslach & Leiter, 2014) and over 12,000 articles appearing in search engines such as PsycINFO and PubMed (Bianchi, Schonfeld, & Laurent, in press). The condition has likely garnered increased attention over the years due to the associated consequences that have been identified in research. Burnout has been associated with adverse health outcomes including cardiovascular disease and musculoskeletal disease (Honkonen et al., 2005), atherosclerosis (Känel, Bellingrath, & Kudielka, 2008), insomnia (Armon, Shirom, Shapira, & Melamed, 2008), obesity (Ahola et al., 2012), chronic fatigue

(Leone, Huibers, Knottnerus, & Kant, 2008), work disability status (Ahola, Toppinen-Tanner, Huuhtanen, Koskinen, & Väänänen, 2008), and mortality (Ahola, Väänänen, Koskinen, Kouvonen, & Shirom, 2010). The American Psychological Association (2013a, 2013b, 2014, & 2015) found that over one-third of Americans surveyed reported problems with physical health, unhealthy eating habits, low levels of physical activity and exercise, significant sleep disturbances, and symptoms of depression and anxiety as a result of chronic stress. A 2015 study (Goh, Pfeffer, & Zenios) estimated that, in the United States alone, more than 120,000 deaths per year and upwards of 8% of annual healthcare costs are associated with occupational distress. In Japan, burnout has become such a widespread and significant concern that the terms "karoshi" and "karojisatsu" are explicitly used to describe work-related death and work-related suicide, respectively (Hiyama & Yoshihara, 2008).

From a business standpoint, burnout appears to have a significant impact on cost and productivity. The American Institute of Stress (n.d.) estimated that 1 million workers in the United States miss work each day due to work-related stress. They also estimated that job-related stress costs the United States over 300 billion dollars annually, due to accidents, absenteeism, turnover, lost productivity, direct medical, legal, and insurance costs, workers' compensations awards, and Federal Employers Liability Act judgments. Burnout has been shown to correlate with work absence (Borritz, Rugulies, Christensen, Villadsen, & Kristensen, 2006; Ahola et al., 2008) and predict absenteeism (Schouteten, 2017), which is estimated to account for 26% of health-related lost productivity in business (Willingham, 2008) and cost the average business approximately 15% of its annual payroll (Gallup State of the American Workplace, 2015). Presenteeism, defined as coming to work despite functioning below one's general capability, has also been linked to burnout, with one study indicating that 60% of

workers reported lost productivity due to chronic occupational distress (Willingham, 2008). Working below one's general capability has important risk-management implications as stress-related distraction and sleepiness have been estimated to account for upwards of 80% of work-related accidents (Health Advocate, Inc., 2009). Burnout has been correlated with workplace violence (Chen, Lin, Ruan, Li, & Wu, 2016; Couto & Lawoko, 2011), with indications of a bidirectional relationship (Magnavita, 2014; Kop, Euwema, & Schaufeli, 1999), providing further evidence for the risk-management implications of chronic occupational distress.

Burnout has also been implicated in lower work engagement. Work engagement is defined as a positive, work-related state which is characterized by energy, dedication, and absorption (Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002). Engagement refers to mental resilience, vigor, enthusiasm, a sense of significance, and engrossment in one's work (Upadyaya, Vartiainen, & Salmela-Aro, 2016). Engagement has been described conceptually as the opposite of burnout (Gonzalez-Roma, Schaufeli, Bakker, & Lloret, 2006; Demerouti, Mostert, & Bakker, 2010; Maslach & Leiter, 2016). According to Gallup Poll's State of the American Workplace study (2017), which defines work engagement as involvement in, enthusiasm about, commitment to, and positive contribution to work, only 32% of Americans are actively engaged in their work. Gallup found that 16% of people surveyed endorsed burnout and would be considered actively disengaged in their work. Of note, Gallup indicated that disengaged employees were almost twice as likely to be diagnosed with depression or anxiety with no previous history of either diagnosis, which appears consistent with research indicating that individuals working in occupations with high levels of stress demonstrated the highest rates of clinical depression (Wulsin, Alterman, Bushnell, Li, & Shen, 2014).

Prevalence rates for burnout have varied in the literature and appear to depend on how burnout is operationalized, as well as the populations and occupations examined. Some research has focused on burnout as a distinct condition characterized by specific dimensions such as exhaustion and cynicism (see review in Aronsson et al., 2017) and other research has either utilized burnout as a general term to account for "stress-related symptoms" (Golkar et al., 2014) or used the term interchangeably with "chronic occupational stress" (Chou et al., 2016). Most research nonetheless appears to indicate significant rates of burnout across populations and occupations.

Research suggests that approximately 28% of the general population in the United States experience burnout (Shanafelt, Hasan, et al., 2015), with upwards of 80% of people rating work as being significantly stressful (Nielsen, 2014) and 33% rating work as extremely stressful (Insightlink's Annual Survey of the American Workplace, 2016). Internationally, burnout research has spread to Asia, the Middle East, Latin America, Australia, Africa, and China (Schaufeli, Leiter, & Maslach, 2008). Research has indicated that burnout prevalence ranges from 13 to 18% in Sweden (Lindblom, Linton, Fedeli, & Bryngelsson, 2006; Norlund et al., 2010) and is approximately 16% in the Netherlands (Kant et al., 2003). Gallup's State of the Global Workplace survey (2013) indicated that out of 19 Western European countries, approximately 20% of individuals report experiencing burnout and being disengaged from their work, with Germany, the United Kingdom, and France reporting the highest percentages (24%, 26%, and 26%, respectively).

With regards to specific occupations, healthcare professions appear to have some of the highest rates of burnout, with estimates ranging between 50 and 63% for physicians (Shanafelt, Hasan, et al., 2015), and between 21 and 43% of medical students (Santen, Holt, Kemp, &

Hemphill, 2010). Even when working in highly satisfying environments, up to 40% of physicians report experiencing significant symptoms of burnout (Shanafelt, Gorringe, et al., 2015). International meta-analyses indicate that burnout affects between 30 and 44% of nurses in emergency room settings (Gómez-Urquiza et al., 2017; Li, Cheng, & Zhu, in press) and could range between 80-86% for healthcare providers in Arab countries (Elbarazi, Loney, Abdelrazeq, & Elias, 2017). Mental health professions, including social workers and psychologists (see review in Carod-Artal & Vázquez-Cabrera, 2013) appear to be at significant risk, with estimates of burnout prevalence reaching as high as 67% for individuals working in the field (Morse, Salvers, Rollins, Monroe-DeVita, & Pfahler, 2012). Other occupations that have been a focus of burnout research include human service workers in child protection agencies, marriage and family therapists, social service volunteers (see review in Thomas, Kohli, & Choi, 2014), teachers (Hakanen, Bakker, & Schaufeli, 2006), and law enforcement officers (Kop, Euwema, & Schaufeli, 1999). Considering the magnitude of consequences associated with burnout and suggested prevalence, it is not surprising that U.S. employers rank stress as the top health and productivity concern (Willis Towers Watson, 2016).

History of Burnout

While Greene's novel (1961) has become one of the more referenced examples in literature discussing the origins of burnout, it is not the first known reference to burnout. The phrase "to burn oneself out" was an English slang that meant "to work too hard and die early" (Partridge, 1961) and entered colloquial speech in the early 1900s (Schaufeli & Enzmann, 1998). One of the earliest known references to burnout was discovered in a collection of Shakespeare poems published in 1599 (cited in Enzmann & Kleiber, 1989), though that example pertained to a relational context rather than an occupational one. Specifically, regarding occupational

distress, Bradley (1969) mentioned the term "staff burnout" in reference to the cognitive and emotional fatigue experienced by probation officers involved in a community-based treatment program for court-involved juvenile offenders. While Bradley was first to introduce the term to professional literature, American psychiatrist Herbert Freudenberger (1974) popularized the term and is generally considered to be the "founding father of the burnout syndrome" (Schaufeli & Buunk, 1996, p. 312). Freudenberger was working as an unpaid psychiatrist at a drug addiction clinic in New York, which was staffed primarily by volunteers. Initially, the volunteers were idealistic and highly motivated, but Freudenberger noticed that many of the volunteers eventually lost their motivation, commitment, and energy due to the demands of the work. He described the observed state as "becoming exhausted by making excessive demands on energy, strength, or resources" (Freudenberger, 1974, p. 159). Ultimately, Freudenberger decided to label the phenomenon using the term "burnout," which was a term used colloquially at the time to refer to the effects of chronic drug abuse (Schaufeli & Enzmann, 1998).

At approximately the same time that Freudenberger was using the term "burnout," a social psychologist by the name of Christina Maslach also began using the term (Maslach, 1976). Maslach and her colleagues were interested in studying how people cope with stressful jobs, particularly individuals in health care professions. While conducting interviews with members of various human service occupations, Maslach and her colleagues noticed commonalities among those interviewed. Specifically, they noticed that individuals with stressful jobs frequently reported developing emotional exhaustion, negative thoughts and feelings towards the individuals they served (e.g., clients, patients, or customers), and a diminished sense of professional competence (Schaufeli et al., 2008). Maslach happened to describe her findings to an attorney, who informed her that poverty lawyers commonly experience the phenomenon and

call it “burnout” (Schaufeli & Enzmann, 1998). Once Maslach and her associates introduced the term to respondents in their studies, they discovered that it was easily and immediately recognized by the interviewees, which led to Maslach and her colleagues adopting the term in their subsequent research (Schaufeli & Buunk, 1996).

While burnout literature through the 1970s was exploratory and anecdotal, Maslach’s work in the 1980s marked the end of the so-called “pioneering phase” and ushered in the more quantitative “empirical phase” (Maslach et al., 2001). As a result of Maslach’s research with human service workers, the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981, 1986) was developed to make the definition and assessment of burnout more specific (Schaufeli & Enzmann, 1998). With the development of the first standardized burnout inventory, the MBI became “almost universally accepted as the gold standard” (Schutte, Toppinen, Kalimo, & Schaufeli, 2000, p. 53) for assessing burnout, with the authors’ definition and multidimensional model of burnout becoming “sanctioned by the research community” (Schaufeli & Enzmann, 1998, p. 7) as the predominant framework (Maslach et al., 2001). Maslach defines burnout as a “psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job” (Maslach, 2018, p. 11). The core dimensions of the multidimensional theory asserted by the MBI include emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach et al., 2001). Maslach and Goldberg (1998) described emotional exhaustion as the basic stress dimension of burnout, characterized by feelings of being depleted of one’s emotional resources, with the primary sources of the depletion coming from work overload and interpersonal conflicts in the workplace. The authors described depersonalization as the interpersonal dimension of burnout, marked by an excessively detached response to others and a loss of idealism, which they suggest develops as a defense mechanism in response to the initial

exhaustion. The final dimension of burnout in their model, personal accomplishment, was described as the self-evaluation dimension of burnout, characterized by a decline in feelings of productivity and self-efficacy at work. In the 1990s, Maslach and colleagues observed a high level of interest and recognized an apparent need for alternative versions of the MBI, which led to the development of the MBI-Educators Survey (MBI-ES; Maslach, Jackson, & Schwab, 1996) for educators, the MBI-General Survey (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996) for people working in occupations other than human service, and the renaming of the MBI to the MBI-Human Services Survey to differentiate it from the newly-created versions (MBI-HSS; Maslach & Jackson, 1996). In order to better translate the MBI to occupations outside of human service, the test authors decided to rename the subscales for the MBI-GS, changing emotional exhaustion to exhaustion, depersonalization to cynicism, and personal accomplishment to professional efficacy. Most recently, Maslach and associates have released two new versions of the MBI, the MBI-Human Services Survey for Medical Personnel (MBI-HSS [MP]; Maslach, Jackson, & Leiter, 2016) and the MBI-General Survey for Students (MBI-GS [S]; Maslach et al., 2016).

Since the popularization of the burnout construct by Maslach and associates in the 1980s and 1990s, several alternative measures of burnout have been introduced, with some that reflect different conceptualizations of burnout (Maslach & Leiter, 2016). Some of the other more widely-known measures of burnout include the Burnout Measure (BM) (Pines & Aronson, 1988), the Oldenburg Burnout Inventory (OLBI; Halbesleben & Demerouti, 2005), the Copenhagen Burnout Inventory (CBI; Kristensen, Borritz, Villadsen, & Christensen., 2005), the Professional Quality of Life Scale (ProQOL; Stamm, 2002, 2005), the Shirom-Melamed Burnout Measure (SMBM; Shirom & Melamed, 2006), and the Bergen Burnout Inventory (BBI; Feldt et

al., 2014). Along with the aforementioned measures, there have also been numerous attempts to provide conceptual definitions and models of burnout (Bakker & Demerouti, 2006; Brill, 1984; Burisch, 1983, 1993, 2006; Cherniss, 1980; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Edelwich & Brodsky, 1980; Farber, 1991; Figley, 1995; Freudenberger, 1974; Hobfoll & Freedy, 1993; Karasek, 1979; Meier, 1983; Muldary, 1983; Pines & Aronson, 1988; Potter, 1998; Schaufeli, 2006; Siegrist, 1996). Since the 1990s, despite Maslach and associates shifting their research focus toward issues related to work engagement and the relationship between the individual and the occupation (Leiter & Maslach, 2017; Maslach, 2017), the MBI continues to be the standard tool for burnout research (Maslach & Leiter, 2016; Schaufeli, Leiter, & Maslach, 2009). As the MBI continues to be the most widely used scale to measure burnout (Lheureux, Truchot, & Borteyrou, 2017), the conceptualization of burnout asserted by the MBI also continues to "dominate the field" of burnout literature (Bianchi, Schonfeld, & Laurent, 2015b, p. 29).

Statement of Problems

Despite more than 40 years of research on the burnout construct, there remain "persistent difficulties in characterizing the phenomenon" (Bianchi et al., in press, p. 2). One of the larger difficulties is that there are no agreed-upon diagnostic criteria for burnout (Bianchi et al., 2015a), which may account for some of the variances in rates of prevalence previously discussed. While burnout may appear to be a significant and pervasive condition, "the prevalence of burnout cannot be estimated for the basic reason that burnout is not diagnosable" (Bianchi et al., in press, p. 2). Without a consensus understanding regarding the theoretical framework and diagnostic criteria of the condition, prevalence studies become speculative in nature, and it becomes unclear if these studies are even measuring the same phenomenon (Heinemann & Heinemann, 2017).

Bianchi, Schonfeld, and Laurent (2016a) eloquently expressed their concerns about the state of burnout literature and the issue of prevalence research when they wrote the following:

> Current practices in burnout research have led to an accumulation of results, the clinical meaning of which is obscure. This state of affairs compromises effective decision making in terms of interventions and public health policies. In our view, continuing down this road will drive burnout researchers to a dead end. Burnout's status should be clarified before more research on its prevalence is planned.
>
> (p. 425)

The reference to burnout's status by Bianchi and associates highlights the arguably more concerning underlying issue of definitional ambiguity that burnout faces as a construct (Schaufeli, 1999).

Aside from definitional ambiguity, burnout literature has been criticized for numerous other reasons. One criticism is that researchers have yet to provide a clear rationale as to why specific dimensions should or should not be included in their conceptualizations of burnout (Shirom, 2005). Another problem is the lack of distinction of burnout from other conditions such as depression (Burisch, 1993) or other work-related conditions such as compassion fatigue, secondary trauma, and vicarious traumatization (Diaconescu, 2015; Portnoy, 2011; Sabo, 2011). The final major criticism of burnout literature relates to an underlying element that appears across all models and definitions – stress. While burnout is often conceptualized within the framework of stress research (Pines and Keinan, 2005), either defining burnout as work-related chronic stress (Penz et al., 2018) or describing burnout as a stress-related disorder (Orosz et al., 2017), there does not appear to be much of an integration of stress literature (i.e. the neurophysiology of the stress response) in the current burnout research. If burnout is related in

some way to a stress process, it appears apparent that stress-related research might help to clarify some of the issues facing burnout as a construct. More specifically, if burnout is related to a chronic stress process, an exploration of allostasis – the process of the body adapting to stress (McEwen, 1998, 2000) – and allostatic load – the consequences of stress adaptation (McEwen & Wingfield, 2010) – might be particularly helpful in elucidating burnout. An exploration of such literature might facilitate a coherent and empirically based theoretical foundation for burnout as a construct, potentially creating a convergent conceptualization. Shirom (2005) provided an overview of burnout research that appears to remain relevant over a decade later when he stated, "researchers diverge strongly as regards the correct conceptualization of burnout and suggests that more work on the theoretical foundations of the construct of burnout is badly needed" (p. 269).

Purpose of the Project

In reviewing the prevalence and history of burnout, it is apparent that whatever burnout is, it is a significant concern. Unfortunately, the current research on burnout is divergent. There is no clear definition of burnout, and the popular models and definitions of burnout do not appear to provide a strong rationale for their conceptualizations. Furthermore, there is no consensus to date on how, if at all, burnout is distinguished from depression or other work-related conditions. Finally, the burnout literature has not adequately explored or integrated current stress literature, despite most burnout literature making some reference to a chronic stress process. The following project aims to address these issues by examining relevant burnout literature; identifying strengths, weaknesses, and commonalities of several of the most popular burnout models and definitions; and exploring stress literature to identify elements of the stress process that might provide clarity on the symptoms, dimensions, and progression of burnout. The goal of this

project is to work toward establishing a clear definition of burnout that integrates current literature in the areas of burnout and chronic stress so that the definition is based on neurobiology, theoretically driven, and non-arbitrary. By providing a clear definition of burnout, the objective is to develop an integrated conceptual model of burnout that can build on the strengths of existing models, address weaknesses and inconsistencies in the literature, distinguish burnout from other conditions, and account for positive work-related concepts. The ultimate aspiration is to create a practical framework for burnout literature moving forward to facilitate improved prediction, assessment, treatment, and prevention of the burnout condition.

Research Questions

The research questions for this study are as follows:

1. Do prevalent definitions of burnout share any conceptual elements?
2. Can the neurophysiology of the chronic stress process (i.e., allostasis and allostatic load) explain the origin, progression, and symptomology of burnout?
3. Can burnout be conceptually distinguished from other conditions, such as depression, compassion fatigue, secondary traumatic stress, and vicarious traumatization?
4. Can the literature on burnout and the chronic stress process be integrated to establish a clear definition and conceptual model of burnout?

Research Procedure

To adequately address the research questions, the scope of the literature reviewed was broad. It included literature regarding burnout among various professions, including mental health care professions, medical health care, service industries, and general labor. The reviewed literature primarily focused on articles specifically pertaining to the concept of burnout but also included research in areas that have historically been tied to burnout and that have been used

interchangeably with burnout, such as depression, compassion fatigue, secondary traumatic stress, and vicarious traumatization. Most of the literature reviewed focused on work-related/occupational burnout, as a majority of the most impactful current research exists in this domain. Literature did, however, also include some findings in academics. The rationale for including academia was based on the desire to establish a definition of burnout that can be generalized as much as possible and to highlight whether contextual differences exist between settings. The literature was primarily based on findings from English-language studies in the United States, as a majority of the most impactful current literature falls within those parameters, but international findings were also explored to facilitate the creation of a generalizable definition.

Literature focusing on specific risk factors of burnout that are related to demographics (e.g., age, sex, race), work settings, or other personal characteristics of the individual were included for context but were not the primary focus of this review. This review was aimed at creating a more general and more practical understanding of the concept of burnout. Literature that focused on mostly unchangeable characteristics do little to empower individuals and promote action toward reducing burnout.

Burnout literature was reviewed first, with a more in-depth exploration of the current challenges facing burnout research, especially the "gold standard" (Williamson, Lank, & Lovell, 2017) model and definition employed by the Maslach Burnout Inventory (Maslach & Jackson, 1981, 1986). Next, the prevalent models and definitions of burnout were explored in order to identify common symptoms and conceptual elements. Conceptual elements and symptoms were then explored and compared to establish domains/categories that are shared in the literature. Stress literature was then reviewed to identify connections between the symptoms and

conceptual elements of burnout and the symptoms and conceptual elements of the chronic stress process. More specifically, the stress literature, including literature regarding allostasis and allostatic load, was utilized to highlight specific neurobiological changes that might account for symptoms and conceptual elements of the various burnout definitions. Following analysis of the burnout literature and literature on the chronic stress process, the literature was integrated to explore a potential definition of burnout and subsequent conceptual model. Findings are then summarized and explored to highlight clinical implications, including practical uses for prediction, assessment, treatment, and prevention. Finally, limitations and recommendations were explored.

CHAPTER II: CRITICISMS OF BURNOUT LITERATURE

Prior to exploring the various models and definitions of burnout, it is essential to clarify further why such exploration is even necessary. The purpose of this section is to review the criticisms of burnout literature to provide a fuller context as to why burnout research to this point is problematic. Considering that the Maslach Burnout Inventory is the "gold standard" of burnout research (Williamson, Lank, & Lovell, 2017), a majority of this section will focus on the criticisms it has faced. This section will also provide an overview of the issues facing other models and definitions of burnout as well as the difficulties researchers have had in distinguishing burnout from other conditions.

In reviewing the history of burnout, Maslach and associates admitted that burnout was "initially a very slippery concept – there was no standard definition of it, although there was a wide variety of opinions about what it was and what could be done about it" (Maslach et al., 2001, p. 402). Unfortunately, it does not appear that much has changed since that admission, as there has yet to be a single definition of burnout that has been widely accepted (Cooper, Dewe, & O'Driscoll, 2001). Although it has become an important phenomenon in the professional literature (Shirom, 2005), it appears that there has not been a "clear definition of the construct of burnout" (p. 268) that has demonstrated "evidence relevant to (its) nomological validity" (p. 269). Burnout has been described as a nebulous construct and a generic term for various types of crises (Burisch, 1993). To date, the field of burnout literature has yet to adequately answer many long-standing questions, specifically related to the conceptualization of the construct and the psychometric properties of the assessment measures (Cox, 2005). There continues to be debate among researchers and practitioners regarding the basic structure, scope, symptoms, course, and distinctiveness of the burnout construct (see review in Bianchi et al., 2015), with conflicting

views on whether burnout is a distinct mental disorder at all (Heinemann & Heinemann, 2017). Researchers continue to diverge on the conceptualization of burnout, with some researchers suggesting that there is a significant need for the field to turn its attention to exploring the theoretical foundations of the construct (Bianchi, Schonfeld, & Laurent, 2015a; 2015b; 2016a, 2016b; Eckleberry-Hunt, Kirkpatrick, & Barbera, 2017; Heinemann & Heinemann, 2017; Shirom, 2005).

Maslach Burnout Inventory

The conceptualization of burnout employed by the MBI is the most commonly used definition to date and appears to dictate and shape the direction of burnout research (Sedlar, Sprah, Tement, & Socan, 2015; Wurm et al., 2016). The explanation for this lies in the assertion that the MBI definition of burnout has become equivalent to the way it is measured (Schaufeli, 1999) and the MBI continues to be the most widely used method of measuring burnout (Lheureux et al., 2017), with 80 to 90% of all empirical burnout research utilizing some form of the MBI (Bianchi et al., 2015a, 2015b; Schaufeli & Enzmann, 1998). The Burnout Measure (BM; Pines & Aronson, 1988) is regarded as the 2nd most widely used burnout assessment tool, and it is only utilized in approximately 5% of all studies (Schaufeli, Bakker, Hoogduin, Schaap, & Klader, 2001). The popularity of the MBI may be more easily explained by it being the first standardized assessment of burnout introduced to the field (Maslach & Leiter, 2016; Schaufeli & Buunk, 1996) rather than by a consensus on the validity of its theory. As noted by Heinemann and Heinemann (2017), the "repeated use of a specific instrument does not necessarily improve the quality or explanatory power of the phenomenon it seeks to measure" (p. 8), and if the instrument or assumptions about the phenomenon are problematic, those problems are simply reproduced rather than being resolved. They go on to specifically cite criticisms of different

burnout measures, including the MBI, and state that these issues can be interpreted as "a sign of a weak definition of the phenomenon (burnout) itself" (p. 8). Despite its overwhelming popularity in the field of burnout research, the MBI is not unfamiliar to criticism.

The MBI has faced significant criticism in the field of burnout research for the methodology involved in its development, the underlying theory it asserts, and how the measurement is utilized in the field. One of the more fundamental criticisms of the MBI's development is that it was not "grounded in firm clinical observation or based on sound theorizing," but instead was "inductively developed by factor-analyzing an arbitrary set of items" (Taris, Le Blanc, Schaufeli, & Schreurs, 2005, p. 239) that were based on data that was collected through exploratory interviews, field observations, and personal experiences (Bianchi et al., in press, p. 2). The MBI manual (Maslach et al., 1997) even states that it was "designed to measure hypothetical aspects of the burnout syndrome" (p. 196). The apparent arbitrariness underlying the creation of the MBI's three dimensions has led to the MBI's definition of burnout being characterized as a "conceptual chimera" (Bianchi et al., 2015b, p. 35). Some researchers have called into question the original interviews and observations that led to the construction of the MBI, highlighting the fact that the authors of the MBI did not systematically investigate the presence of other conditions (Bianchi, Schonfeld, & Laurent, 2015d). It has been suggested, consequently, that the MBI conceptualization of burnout symptoms as components of a separate disorder may be an error resulting from a "poorly controlled approach to illness characterization" (Bianchi, Schonfeld, & Laurent, 2015d, p. 2).

From a psychometric perspective, the MBI has also been accused of numerous faults. As Demerouti, Bakker, Nachreiner, and Schaufeli (2001) note, the questions that make up each dimension of the MBI are all worded in the same direction, with all of the questions making up

the emotional exhaustion and depersonalization dimensions phrased negatively (e.g., “I feel frustrated by my job” and “I’ve become more callous toward people since I took this job”) and all of the questions making up the personal accomplishment/inefficacy dimension phrased positively (e.g. “I have accomplished many worthwhile things in this job”). This one-sided wording is problematic and considered inferior to mixed-item scales (containing both positively and negatively worded items), because one-sided scales can lead to artificial factors (Lee & Ashforth, 1990) in which positively worded and negatively worded items are likely to cluster with each other (Demerouti, Bakker, Vardakou, & Kantas, 2003; Doty & Glick, 1998; Sedlar et al, 2015). Additionally, one-sided scales increase the likelihood of acquiescence bias, which is the tendency for survey respondents to agree with questions regardless of their content (Demerouti, Bakker, De Jonge, Hanssen, & Schaufeli, 2001). Considering two out of three of the MBI dimensions are negatively worded, acquiescence bias may increase the likelihood of agreeing with symptoms, thus inflating burnout scores. It has been hypothesized that respondents process items from the dimensions of emotional exhaustion and depersonalization differently than items from personal accomplishment, only due to the valence presented rather than the precise content, which is likely to artificially increase the correlations between emotional exhaustion and depersonalization items and artificially decrease their correlations with personal accomplishment items (Lheureux et al., 2017).

Another significant issue with the MBI is that while its theory is multi-dimensional, its application is not multi-domain. The MBI defines burnout as being specific to the work context (Maslach et al., 2001) and restricts the application of the measure to the occupational domain (Bianchi, Truchot, Laurent, Brisson, & Schonfeld, 2014). This work-restricted characterization does not allow for a comparative assessment of the emotional exhaustion, depersonalization, and

personal accomplishment dimensions beyond the work context, and may lead to the MBI being "self-fulfilling" in the sense that high scores will reflect "burnout" with no way of knowing if the high scores are related to non-work factors (Bianchi et al., 2015d). Several studies have discovered associations between job burnout and non-work factors such as personal life events, such as major illness, and family-related variables, such as the number of children (see review in Bianchi, Truchot, et al., 2014). However, since the MBI does not apply a specific time reference to the measurement of burnout (Hultell & Gustavsson, 2010), such as asking about "symptoms during the last two weeks or longer periods of time" (p. 263), it would be challenging to compare symptoms of burnout to non-work factors during a consistent time frame even if that information was available.

Regarding the specific questions of the MBI, there appear to be valid concerns about the items utilized. Statements such as "I feel like I'm at the end of my rope" and "I feel used up at the end of a workday" (Maslach, Jackson, & Leiter, 1996) are not well-defined and may more closely resemble depressive features (Bianchi et al., 2015b). In particular, items such as "I feel like I'm at the end of my rope" and "I feel very energetic" are intended to assess job-related experiences, but the wording of these items is generic and can apply for a number of reasons that are not necessarily related to the job, such as the level of home stressors (Bianchi, Schonfeld, & Laurent, 2017). The items "I feel very energetic" and "Working with people directly puts too much stress on me" have been criticized by the MBI authors themselves (Maslach, Jackson, & Leiter, 1996), suggesting that the items be removed due to findings that the first item measured emotional exhaustion instead of the intended dimension of personal accomplishment, and the second item overlapped with the depersonalization dimension instead of the intended dimension of emotional exhaustion (Loera, Converso, & Viotti, 2014). The item "I feel burned out from my

work" is also problematic because the MBI does not operationalize what it means to feel "burned out," therefore, it "presumes that each individual conceptualizes burnout in the same way" (Eckleberry-Hunt et al., 2017, p. 2). Of note, the MBI manual (Maslach, Jackson, & Leiter, 1997) clearly states that "people have widely varying beliefs about burnout" (p 195) and cautions that "respondents must be unaware that the MBI is a burnout measure, and they must not be sensitized to the general issue of burnout" (p. 196). Moreover, since the MBI and the MBI definition of burnout are considered to be two sides of the same coin, in that "burnout is what the MBI measures, and the MBI measures what burnout is" (Kristensen et al., 2005, p. 193), asking respondents if they feel "burned out" appears as though the MBI definition of burnout essentially equates to whether or not a person says they have burnout. This point may be further solidified when looking at research on single-item measures of burnout that indicates that the item "I feel burned out from my work" has the highest factor loading on the emotional exhaustion domain and demonstrates equivalent validity compared to the full MBI domain (West, Dyrbye, Satele, Sloan & Shanafelt, 2012).

The three dimensions identified by the MBI have also been called into question by researchers. The method in which burnout is conceptualized and operationalized as a function of the MBI dimensions is unclear (Bianchi et al., in press; Kristensen et al., 2005). Considering that the MBI dimensions were based on factor analysis of observations that were arbitrarily chosen, researchers argue that "if other items had been submitted to the original factor analysis…other dimensions would have emerged, and burnout would have been defined differently" (Bianchi et al., 2015d, p. 2). Despite emotional exhaustion, depersonalization, and personal accomplishment reportedly being confirmed by factor analysis as distinct and different, the MBI manual formally instructs that the three components be measured and examined individually (Maslach, Jackson,

& Leiter, 1996). The MBI further states that "the scores for each subscale are considered separately and are not combined into a single, total score. Thus, three scores are computed for each respondent" (Maslach, Jackson, & Leiter, 1996, p.5). This is problematic because it means that the MBI maintains one concept, but three independent measures, resulting in respondents essentially being assessed for three different levels of burnout, with each level being considered as the same condition, but with very different symptoms (Kristensen et al., 2005). Interestingly, work by Periard (2016) not only indicated that the three dimensions of the MBI have such a high mean correlation as to suggest the presence of a common factor, but in testing a bifactor model, the author was able to identify a singular "general burnout dimension" that provided a superior fit and was demonstrated to be significantly more reliable than any of the subscales. The author went on to state that the level of inter-correlation between the MBI dimensions makes the subscales "unreliable" and "inappropriate to report" (p. 51).

As stated by the test authors (Maslach, Jackson, & Leiter, 1996, 1997), the MBI's three dimensions are interpreted as being a causal process, with emotional exhaustion directly causing depersonalization (Maslach & Goldberg, 1998), and then leading to a reduction in personal accomplishment. This linear progression is problematic to assume because the MBI was not originally designed to capture such a process (Taris et al., 2005). Taris and associates (2005) go on to point out that most burnout literature using the MBI has been cross-sectional, making it challenging to identify a causal progression of dimensions since there are insufficient longitudinal studies to validate such a claim. Of the longitudinal studies that have been conducted, some have indicated that high levels of emotional exhaustion are associated with lower levels of depersonalization across time, high levels of personal accomplishment are associated with low levels of depersonalization across time, and high levels of personal

accomplishment are associated with higher levels of emotional exhaustion across time (see review in Taris et al, 2005, pp 241-242). These findings are concerning because they do not appear to align with the proposed model of burnout presented by the MBI.

While Maslach (2018) maintains that burnout consists of three dimensions, research has been inconsistent in validating the three distinct domains. Depersonalization is often framed as a coping strategy that arises in response to emotional exhaustion (Maslach & Goldberg, 1998), which could arguably be better conceptualized as a consequence of burnout rather than a definition of the construct (Kristensen et al., 2005). Including behavioral aspects, such as coping, in assessments that also examine affective elements may create confounds between the construct being measured and the associated behaviors related to it (Shirom & Melamed, 2006). Personal Accomplishment, which has also been argued to be a consequence of burnout (Koeske & Koeske, 1989; Kristensen et al., 2005; Shirom, 1989), may not even be a core dimension of the burnout construct.

Some research has indicated that personal accomplishment does not have to be present for burnout to occur, suggesting that the dimension is a secondary effect of burnout (Bakker, Demerouti, & Verbeke, 2004; Green, Walkey, & Taylor, 1991; Shirom, 1989). Research has indicated that personal accomplishment "develops largely independent from the other two burnout dimensions," (Schutte, Toppinen, Kalimo, & Schaufeli, 2000, p. 55) and may actually reflect a personality characteristic similar to self-efficacy, rather than a specific element of the burnout construct (Cordes & Dougherty, 1993). Even when accounting for the one-sided wording of the personal accomplishment dimension (Demerouti et al., 2001) by changing the questions to be framed in a negative direction, studies have suggested that personal accomplishment still falls outside of the burnout construct (Breso, Salanova, & Schaufeli, 2007;

Schaufeli & Salanova, 2007). Ultimately, if depersonalization and personal accomplishment are consequences of burnout, rather than core dimensions of the construct, the distinction may be arbitrary, as "symptoms and consequences can both be viewed as manifestations of burnout" and depend on "the conceptualization and operationalization of burnout" (Schaufeli & Bunk, 1996, p. 323), which has yet to be clarified or agreed upon.

It has been mentioned that the MBI's stance on its own dimensions has been inconsistent (Bianchi et al., in press). During development, the preliminary form of the MBI had 47 items, which was reduced to 25 following factor analysis and application of a set of selection criteria (Maslach et al., 1997). The first version of the MBI not only contained three additional items than it does currently, but those additional items contributed to an additional dimension, the involvement scale (Maslach & Jackson, 1981). The involvement scale included the items "I feel similar to my recipients in many ways," "I feel personally involved with my recipients' problems," and "I feel uncomfortable about the way I have treated some recipients" (Maslach & Jackson, 1981, p. 103). Later versions of the MBI made the involvement scale optional and eventually eliminated it, along with the three additional items (Maslach & Jackson, 1986). The original version of the MBI also included a double rating of each item, with a secondary scale for respondents to rate not only the frequency of symptom, but also the intensity of symptoms ranging from "very mild, barely noticeable" to "very strong, major" (Maslach & Jackson, 1986, p. 100). This scale was removed due to reported redundancy (Maslach et al., 1997).

Regarding the currently utilized dimensions, Maslach et al. (2001) noted that "(emotional) exhaustion is the central quality of burnout," the "most obvious manifestation," and "a necessary criterion for burnout" (pp. 402-403), then went on to say that emotional exhaustion is "not sufficient" for identifying burnout (p. 403). This statement has been considered

contradictory to the very structure of the MBI, which assesses dimensions independently with no combined total score (Bianchi et al., in press). The test authors initially criticized others for focusing on only the emotional exhaustion component of burnout (Maslach et al., 2001), but now regard other models as simply reflecting "different conceptualizations of burnout" (Maslach & Leiter, 2016, p. 104). Despite claiming that all three dimensions of the MBI are required for the conceptualization and assessment of burnout (Maslach, Jackson, & Leiter, 1996), the test authors have admitted that the relationship of personal accomplishment to the other two aspects of burnout is "somewhat more complex" (Maslach et al., 2001) and indicated that the correlations between the personal accomplishment subscale and the other two dimensions are low (Maslach et al., 1997). Notably, in a 2016 article, Maslach and Leiter discussed findings from various studies on burnout and used studies that only focused on the depersonalization dimension or a combination of the depersonalization and emotional exhaustion dimensions as examples of the impact of burnout. These examples suggest that the test authors not only hold personal accomplishment as being as less important to the definition of burnout, but they also use single dimensions to represent the entire construct. Later in the article, Maslach and Leiter go on to discuss findings that indicate depersonalization "may be more of a core part of burnout than (emotional) exhaustion" (2016, p. 109), and state that the endpoint of burnout may consist of only the depersonalization dimension.

Up until 1996, the MBI was focused on only human service workers (Kristensen et al., 2005). The test authors not only restricted the definition of burnout to human service work, but they stated that burnout is caused by factors associated explicitly with human service work (e.g., high emotional load; Maslach & Jackson, 1986). This definitional restriction is problematic because there are individuals in occupations not related to human service work that experience

burnout (Bakker, Schaufeli, Sixma, Bosveld, & van Dierendonck, 2000; Demerouti, Bakker, De Jonge, et al., 2001; Demerouti, Bakker, Nachreiner, & Schaufeli, 2000, 2001; Leiter & Schaufeli, 1996). If utilizing the broader definition of occupation, which is "an activity in which one engages" (Occupation, n.d.), the definitional restriction becomes even more problematic since non-work-related activities such as parenting (Hubert & Aujoulat, 2018; Roskam, Brianda, & Mikolajczak, 2018) and pursuing higher education (Kim et al., 2018; Robins, Roberts, & Sarris, 2018) have also been associated with burnout.

Furthermore, it has been argued that the assumption of burnout being restricted to the human service sector cannot be challenged or tested because the MBI cannot be utilized by groups outside of the human service sector (Kristensen et al., 2005). The test authors stated that some researchers had used the MBI with occupational groups other than human service workers and those studies indicated that the MBI's three-factor structure was not maintained across groups, explicitly mentioning that depersonalization and emotional exhaustion dimensions "tended to combine into one factor" (Maslach et al., 1997, p. 208). Unfortunately, the test authors did not provide any citations for the referenced research, nor did they provide any rationale as to why the dimensions mentioned above might have combined into one factor. If burnout is truly a condition exclusively for individuals in the human services sector though, it would seem reasonable to expect that individuals using the tool outside of its intended purpose would produce findings outside of its expected results, suggesting that the problem could lie more with the researchers misusing the tool than the test authors. Yet, the test authors did go on to create additional versions of the MBI due to "increasing interest in burnout within occupations that are not so clearly people-oriented" (Maslach et al., 2001, p. 402). The test authors do not

appear to provide any additional justification for creating new measures other than stating that there was a demand for it (Maslach, Jackson, & Schwab, 1996).

Despite the MBI manual relating burnout to "a quality of the social environment of work" (Maslach et al, 1997, p. 203), and defining burnout as a psychological syndrome that occurs "among individuals who work with other people in some capacity" (p. 192), the MBI-GS section of the manual states that burnout is "a crisis in one's relationship to work, not necessarily a crisis in one's relationships with people at work" (pp. 208-209). The MBI-GS asserts that it measures the same three dimensions as the original version, using only slightly revised items while maintaining a consistent factor structure across a variety of occupations (Maslach et al., 2001). That assertion has been questioned since the previous version of the MBI contained 4 questions related to personal symptoms, 9 questions related to work, and 9 questions related to interactions with clients/recipients, for a total of 22 questions, whereas the MBI-GS has 16 questions, and they are only related to work (Kristensen et al., 2005). Curiously, the theoretical position that burnout is specific to the human service sector does not appear to have been withdrawn or reformulated, nor has the definition of burnout been modified (Kristensen et al., 2005). The ambiguity of the burnout construct following the decision to create alternative forms of the MBI was summed up by researchers reviewing the measure when they defined burnout as "a mental condition that is similar but not identical to the classical definition of the syndrome" (Schutte, Toppinen, Kalimo, & Schaufeli, 2000, p. 54).

Disregarding the criticisms to the MBI's construction and underlying theory, how the measure has been utilized in research has been called into question. One major concern relates to the MBI's use as an individual assessment tool. Despite being used to discriminate between individuals with and without burnout, the MBI was not designed with that decision in mind;

rather it was intended to provide a continuum of low levels of burnout to high levels (Heinemann & Heinemann, 2017). The MBI did eventually provide cut-off points to aid in distinguishing burnout cases from non-burnout cases, but it has been noted that the cut-off points are arbitrary and have not been clinically validated (Schaufeli, Bakker, Hoogduin, Schaap, & Klader, 2001). The test authors divided the sample into three equally-sized groups labeled "low," "average," and "high," but even stated "it is strongly recommended that the original numerical scores be used rather than the categorizations of low, average and high" (Maslach & Jackson, 1986, p. 9). Although the MBI explicitly states that "neither the coding nor the original numerical scores should be used for diagnostic purposes" (Maslach & Jackson, 1986, p. 9), the MBI is the most widely used assessment tool for diagnosing the condition (Heinemann & Heinemann, 2017). The MBI authors eventually endorsed a decision rule for combining scores of the three dimensions, indicating that burnout could be diagnosed for an individual who scored highly on emotional exhaustion and one of the other two dimensions (Schaufeli, Leiter, & Maslach, 2008). Unfortunately, burnout research has not consistently utilized any specific criteria for identifying burnout with the MBI, raising the question of "whether all the studies that identify particular causes of burnout or measure the prevalence rates are actually investigating the same phenomenon" (Heinemann & Heinemann, 2017, p. 7.). In examining various burnout studies, Eckleberry-Hunt et al. (2017) indicated that researchers were classifying individuals as having burnout through the use of single dimension high scores in either emotional exhaustion or depersonalization, single item questions such as "are you burned out", or self-report numerical rating scales of burnout with no definition provided to the participants. The authors also suggested that the dichotomous use of the MBI fails to capture individuals who are "neither well nor burned out," and recommended that continuous scaling methods of categorization be utilized.

Further complicating matters, Squires et al. (2014) identified several methodological concerns in burnout research utilizing the MBI in non-English-speaking countries. Squires and associates reported that there is a "notable lack of attention paid to the translation process" of the MBI to other languages in burnout research. They stated that studies that fail to pre-evaluate the cross-cultural applicability of assessment measures might not obtain reliable or valid results. The authors reported that researchers tend to utilize only "simple forward and backward translation" through the use of translators, which they suggested is "insufficient to produce a valid translation" and might produce artificially high or low results. When examining the literature, the authors discovered that some translations of the MBI led to the word "burnout" being substituted with a word that meant "exhaustion," which further confounds the issues mentioned above related to single burnout dimensions being used to represent the entire concept. Conceptually, Squires and associates warned that the idea of feeling "burnt out" might not align with certain cultural norms and values. They stated that most burnout literature does not carefully and systematically translate and evaluate the cross-cultural relevance of assessment measures before data collection. Therefore, the authors conclude, there is no guarantee that the concepts measured apply the same way in other countries, thus calling into question research using translations of the MBI.

Other Burnout Models and Measures

While the MBI has been criticized for its methodology, theory, and utilization, there does not appear to be a clear-cut alternative. When examining the MBI model and similar models of burnout, Taris et al. (2005) concluded that none of the models appeared to be substantiated. The MBI model asserted a linear progression where emotional exhaustion occurred first, followed by depersonalization, and then lowered personal accomplishment. The Golembiewski phase model

of burnout (Golembiewski, Munzenrider, & Stevenson, 1986) maintained that depersonalization occurred first, followed by lower personal accomplishment, then emotional exhaustion. Lee and Ashforth (1993) compared the two models and proposed that emotional exhaustion directly decreased personal accomplishment and led to depersonalization, suggesting that depersonalization was not a mediator. In examining all these studies, Taris et al. (2005) indicated that none of the models were fully supported based on a meta-analysis of longitudinal studies and suggested that all the models lacked some conceptual strength. The authors challenged the popular notion that depersonalization was a coping strategy to minimize the effects of emotional exhaustion or lower personal achievement. They argued that depersonalization should correlate with reduced levels of emotional exhaustion or higher levels of personal achievement at some point in longitudinal research if depersonalization were a coping strategy. According to other research regarding depersonalization, it appears that higher levels of depersonalization are associated with higher perceptions of job demands and higher levels of subsequent exhaustion (Bakker, Schaufeli, Sixma, Bosveld & van Dierendonck, 2000; De Lange, Taris, Kompier, Houtman, & Bongers, 2004).

Arguably more concerning than the uncertainty regarding dimension progression is the lack of clarity regarding the dimensionality of burnout in general, as there has yet to be a consensus on whether burnout is comprised of one, two, or three dimensions (Cox, 2005), and researchers have yet to provide a clear rationale as to why certain dimensions should or should not be included in their conceptualizations (Shirom, 2005). The MBI model of burnout (Maslach, Jackson, & Leiter, 1996) posits that burnout consists of three dimensions, despite originally containing four dimensions (Maslach & Jackson, 1981). While some early burnout studies supported a three-dimensional structure of burnout, consisting of exhaustion,

demoralization, and loss of motive (see review in Schaufeli et al., 2001), many researchers have relied on the broad category of exhaustion to represent burnout (Brenninkmeyer, Van Yperen, & Buunk, 2001; Freudenberger, 1974), with some including subdomains of physical, emotional, and cognitive exhaustion (Hobfoll & Freedy, 1993; Pines & Aronson, 1988; Shirom & Melamed, 2006). Other models conceptualize burnout as being comprised of two dimensions, such as Alarcon (2007), who defines burnout as a condition consisting of emotional exhaustion and cynicism. The underlying theory behind the Oldenburg Burnout Inventory (OLBI; Halbesleben & Demerouti, 2005) and the Job Demands-Resources model of burnout also characterize burnout as containing emotional exhaustion and cynicism or disengagement (Bakker & Demerouti, 2006). While it appears that research has largely used cynicism and disengagement interchangeably, some research has suggested that they are separate constructs depending on the context of the work environment (Salanova et al., 2005). Additionally, research on burnout in off-shore oil industry workers indicates that there may be a dimension of burnout, worry about home when absent, that is entirely separate from exhaustion, cynicism, disengagement, and personal achievement, suggesting that "certain burnout components may be industry or profession specific" (Hellesøy, Grønhaug, & Kvitastein, 2000, p. 245).

Context has been another area of burnout which has lacked consensus in the literature and has contributed to burnout's overall dimensionality problem. While Maslach and Jackson (1986) initially theorized that burnout occurs solely within the context of human service work, others have argued that "there is no reason to assume that burnout is limited to the human services" (Schaufeli & Taris, 2005, p. 260). Moreover, Kristensen et al. (2005) proposed in the theory underlying their burnout measure, the Copenhagen Burnout Inventory, that burnout applies not only applies to a broad range of work contexts, but also the individual's personal life. If burnout

is a multi-domain phenomenon, impacting both work and personal life, it would stand to reason that burnout might include dimensions beyond the scope of work (e.g., life satisfaction).

While there does appear to be some more recent support for burnout being a multi-domain phenomenon (Thuynsma & de Beer, 2017), researchers have cautioned against broadening the definition of burnout across domains, as it "causes the distinction between burnout as a work-related phenomenon and general, context-free fatigue to become blurred" (Schaufeli & Taris, 2005, p. 261). Cox (2005) warns that "the more broadly burnout is defined, the more it merges with stress," suggesting that the more inclusive burnout becomes as a concept, the less value it adds to understanding work-related stress.

The ambiguity of burnout as a distinct construct appears to remain largely because literature continues to lack a single comprehensive theory (Alarcon, 2011). Researchers have observed that early characterizations of burnout consisted solely of "laundry lists" of symptoms (Schaufeli & Buunk, 1996), with reviews revealing over 130 symptoms across the literature (Burisch, 1989). Burnout has been described as a "set of many definitions" with "no consistent valid definition" (Korczak, Huber, & Kister, 2010). One of the more significant conceptual questions that has yet to be definitively agreed upon is whether burnout is a continuous or dichotomous condition (Cox, 2005). While some researchers have taken the stance that burnout can be both a state and a process (Schaufeli & Buunk, 1996), the "majority of burnout research" appears to utilize measures that imply a continuous process, yet also incorporate 'cut off' scores that imply a dichotomous state (Cox, 2005, p. 190). A systematic review of burnout literature conducted by Doulougeri, Georganta, & Montgomery (2016) revealed that there continues to be considerable variability in how researchers assign degrees of burnout and distinguish between

cases and non-cases of burnout, with none of the reviewed studies offering any validation or justification for the chosen classifications of burnout.

According to Heinemann & Heinemann (2017), "There is still a lack of systematic enquiry into the etiology and psychopathology of the burnout syndrome" (p. 2). The authors assert that most burnout research appears to assume that there is no doubt about the concept of burnout and that the measurement of burnout is "failsafe." Additionally, they state that "current burnout research uncritically reproduces the blurry idea of burnout again and again, and in doing so, just reinforces it" (p. 9). The apparent perpetuation of burnout as a clear and certain construct in the literature is problematic, especially when considering the abundance of prevalence research, since burnout does not have binding diagnostic criteria (Weber & Jaekel-Reinhard, 2000) and is not a recognized diagnosis in any commonly used classification systems (Kaschka, Korczak, & Broich, 2011). While some research has utilized the International Classification of Diseases (10th rev.; ICD-10; World Health Organization, 1992) criteria for the diagnosis of "neurasthenia" or the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV; American Psychological Association, 1994) criteria for the diagnosis "undifferentiated somatoform disorder" (see review in Kleijweg, Verbraak, & Van Dijk, 2013) as proxy measures for burnout, these choices have been arbitrary and have yet to be validated by empirical studies (Kleijweg, Verbraak, & Van Dijk, 2013).

Relationship Between Burnout and Other Conditions

Arguably the most concerning issue facing the burnout construct is that it has not been definitively distinguished from other conditions, particularly depression. Burisch, whose literature review found over 130 symptoms associated with burnout (1989), stated that "none of these many symptoms is unique to the burnout syndrome, i.e., not to be found in other

nosological entities, such as depression" (Burisch, 1993, p. 77). Some researchers have stated that the overlap between burnout and diagnoses like depression is so large that it appears "unnecessary to validate burnout as a diagnostic entity" (Kaschka, Korczak, & Broich, 2011, p. 783). Regarding the apparent relationship between burnout and exhaustion, Shirom (2005) asserted that research does not account for the possibility that the relationship could be, at least in part, due to "unspecified negative affect of depressive symptomology" (p. 269). While some research has suggested that depression is characterized by symptoms that are not found in burnout, such as sadness, guilt, hopelessness, feelings of worthlessness (Suls & Bunde, 2005) and perceived loss of status (Brenninkmeyer, Van Yperen, & Buunk, 2001), other research has indicated that there is no diagnostically significant difference between the presentation of those with burnout and those with depression (Bianchi, Boffy, Hingray, Truchot, & Laurent, 2013), even suggesting that burnout may be a specific type of depression (Bianchi, Schonfeld, & Laurent, 2014; Kahn, 2008; Quitkin, 2002; Rydmark et al., 2006; Schonfeld & Bianchi, 2016).

Irrespective of the relationship between burnout and depression, there remains a significant level of ambiguity regarding the relationship between burnout and other work-related concepts. Compassion fatigue, a popular term in occupational distress literature, was first used in reference to nurses experiencing burnout (Joinson, 1992). Some literature has suggested that compassion fatigue is a type or subcategory of burnout (Portnoy, 2011), while other research has indicated that compassion fatigue is a precursor to burnout (Ray, Wong, White, & Heaslip, 2013). Some literature has stated that compassion fatigue is a synonym for burnout and can be used interchangeably (Hinderer et al., 2014), while other literature has taken the stance that compassion fatigue is a separate condition from burnout (Boyle, 2011).

The term compassion fatigue became popularized by Figley (1995) in his work with burnout and secondary traumatic stress, another concept that has yet to be definitively distinguished from burnout and other work-related concepts. Some literature has used compassion fatigue interchangeably with other work-related concepts (Craig & Sprang, 2010), while other research has demonstrated significant differences between conditions such as compassion fatigue and secondary traumatic stress (van Mol et al., 2015). Some researchers have concluded that secondary traumatic stress, in combination with burnout, leads to compassion fatigue (Galiana, Arena, Oliver, Sansó, & Benito, 2017). Of note, Figley has also introduced the concept of compassion satisfaction (Stamm & Figley, 2009), which is thought of as the opposite of compassion fatigue and is defined as the positivity and gratification experienced from caregiving (Ray et al., 2013).

Vicarious traumatization is another work-related concept that has been used in multiple contexts throughout occupational research. The term has often been used interchangeably with secondary traumatic stress, but some researchers have indicated that there are significant differences between the two concepts (Jenkins & Baird, 2002). Other research has suggested that vicarious traumatization, secondary traumatic stress, and burnout are identical conditions (Devilly, Wright, & Varker, 2009). Cieslak et al. (2014) stated that vicarious traumatization co-occurs with secondary traumatic stress, compassion fatigue, and burnout, implying that they are all separate conditions. Similar to compassion fatigue, vicarious traumatization and secondary trauma have positive counterparts. Focusing on the positive effects that trauma can have on helping professionals, the concept of vicarious resilience refers to the personal growth that is experienced as a result of exposure to the resilience of others (Killian, Hernandez-Wolfe, Engstrom, & Gangsei, 2017), while vicarious posttraumatic growth refers to positive changes in

self-perception, interpersonal relationships, and overall life philosophy that result from work-related trauma exposure (Hyatt-Burkhart, 2014). Ultimately, research has characterized the concepts of compassion fatigue, secondary traumatization, and vicarious traumatization as containing symptoms such as depression, sleep disturbances, relational conflicts, and physical complaints, all of which have been commonly used symptoms in literature referencing the concept of burnout (Ray et al., 2013).

In reviewing the current state of burnout literature, it becomes clear that there is a need for further exploration. Despite the MBI's popularity and frequency of use in the field, it has faced several criticisms. Numerous concerns have been identified regarding the MBI's methodology, its underlying theory, and how it is utilized in the field. Unfortunately, other models do not appear to have added any clarity to the burnout construct. It appears that there has yet to be a conceptualization of burnout that has utilized a comprehensive theory, provided a clear definition, and that distinguishes burnout from other conditions such as depression.

CHAPTER III: REVIEW OF BURNOUT MODELS

Having highlighted the abundance of issues surrounding the construct of burnout, it is important to review the burnout literature in more depth. This chapter aims to explore the prominent burnout literature to identify commonalities amongst the various definitions and models that have been presented in burnout research from the 1970s with Freudenberger (1974) to the social-exchange model of burnout by Schaufeli in 2006. By identifying commonalities in the literature, it may be possible to extrapolate those findings into general conceptual elements to begin developing an integrated model of burnout.

For the sake of organization, the review of models and definitions will be divided into two sections based on a previously mentioned area of contention in the literature, which is whether burnout is a dichotomous state or a continuous process (Cox, 2005). By grouping the research by its stance on burnout as a state or a process, comparisons between models may be simplified since they would presumably be operating from a similar conceptual framework, at least in one regard.

State-based Models of Burnout

Freudenberger. According to Freudenberger (1975), burnout is a state of fatigue or exhaustion caused by devotion to a cause, a way of life, or a relationship that fails to yield an expected reward. Freudenberger (1974) describes the syndrome as including a pattern of neglecting one's own needs, working too long and too intensely, and feeling pressures coming from within the self, from clients (or recipients), and administrators. His view of burnout utilizes an energy depletion metaphor in which energy resources are depleted (Schaufeli & Enzmann, 1998). He asserted that the syndrome is directly related to the degree of commitment that an

individual has in their job and the frustration experienced by the failure to achieve objectives (Freudenberger, 1974).

Maslach and associates. Originally, Maslach and Jackson (1981) defined burnout as "a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who do 'people-work' of some kind" (p. 1). The original definition indicated that burnout resulted from chronic and emotionally draining social interactions between helpers and recipients (Schaufeli & Enzmann, 1998). Currently, Maslach's definition of burnout refers to a syndrome that results from chronic exposure to interpersonal stress in the workplace (2018). As mentioned, Maslach's model of burnout includes the dimensions of exhaustion, depersonalization, and a decreased sense of personal accomplishment.

Perlman and Hartman. Perlman and Hartman (1982) defined burnout as a response to chronic emotional stress. They asserted that burnout consists of three components: exhaustion (emotional and physical), lowered job productivity, and over-depersonalization. In their review of burnout literature, they identified five categories of variables that were significantly related to burnout. The categories included organization characteristics, perceptions of the organization, perceptions of the role, individual characteristics, and outcomes such as satisfaction and turnover.

Meier. Meier (1983) characterized burnout as a state "in which individuals expect little reward and considerable punishment from work because of a lack of valued reinforcement, controllable outcomes, or personal competence" (p. 899). The model emphasizes the value and meaning of work outcomes, the relationship between effort and reward, and the perception of personal competence. According to Meier, burnout is the result of a pattern of expectations regarding positive reinforcement (low), punishment (high), autonomy (low), and efficacy (low)

which cause an individual to experience unpleasant feelings and behave in unproductive ways. Meier's approach highlighted the cognitive and behavioral aspects of burnout, as well as the importance of considering both the personal characteristics and environmental influences on the development of burnout.

Brill. According to Brill (1984), burnout is "an expectationally mediated, job-related, dysphoric and dysfunctional state in an individual without major psychopathology who has (1) functioned for a time at adequate performance and affective levels in the same job situation and who (2) will not recover to previous levels without outside help or environmental rearrangement" (p. 15). Brill asserted that burnout is the result of a long-term imbalance of demands and resources as a result of prolonged job stress. Furthermore, he indicated that while stress can lead to burnout, they are distinct concepts and not all individuals who experience significant stress are suffering from burnout.

Pines and Aronson. The definition of burnout presented by Pines and Aronson (1988) asserts that burnout is a state of physical, emotional, and mental exhaustion. According to their description of symptomology, physical exhaustion is characterized by loss of energy, weakness, and fatigue; emotional exhaustion is characterized by feelings of helplessness and hopelessness; and mental exhaustion is characterized by negative attitudes about self, others, work, and life in general. They indicated that burnout is the result of long-term emotionally demanding situations and suggest that it applies to all life domains. This definition claims that burnout is ultimately caused by an individual's need to give life meaning combined with the failure of work to meet the individual's need.

Farber. In his work with teacher-related occupational stress, Farber (1991) defined burnout as "a work-related syndrome that stems from an individual's perception of a significant discrepancy between effort (input) and reward (output)" (p.24). According to Farber, this perception is influenced by individual, organizational, and social factors. Symptoms included in Farber's conceptualization include withdrawal, cynicism, emotional and physical exhaustion, irritability, anxiety, and depression.

Figley. In his research, Figley (1995) used the term "compassion fatigue" to encapsulate burnout and secondary traumatic stress. He described burnout as being a result of a combination of continuous use of empathy and occupational stressors. Figley identified seven areas of functioning that are adversely affected by burnout – cognitive, emotional, behavioral, spiritual, interpersonal, psychosomatic, and work. The cognitive domain includes symptoms such as impaired concentration, low self-esteem, apathy, disorientation, perfectionism, and preoccupation with traumatic experiences. The emotional domain includes symptoms such as feelings of weakness, guilt, anger, fear, sadness, and depression. Behaviorally, Figley identified impatience, social withdrawal, sleep problems, eating disorders, and proneness to accidents as possible symptoms. In the spiritual category, he identified loss of hope, anger with the divine, loss of purpose, and overall existential concerns regarding the value of life as symptoms. Interpersonally, he highlighted that individuals with burnout may be more isolated, experience a loss of interest in relationships and sex, and may feel intense loneliness. In the psychosomatic domain, Figley identified physical symptoms such as excessive perspiration, accelerated respiration, increased pulse, shortness of breath, muscle aches, and dizziness. Finally, in the domain of work, Figley stated that low morale, loss of motivation, negativity, alienation,

decreased performance, and unfulfilled duties may be work-related effects associated with burnout.

Potter. Potter (1998) defined burnout as "job depression – a malaise of the spirit" (p. 9). She described burnout as being a type of fatigue that negatively impacts motivation and diminishes the ability to mobilize one's capabilities. According to Potter, burnout symptoms can include negative emotions such as frustration, dissatisfaction, feelings of injustice, or depression. Other symptoms indicated were interpersonal problems, emotional withdrawal, health problems, reduced efficiency at work, potential substance abuse, and feelings of meaninglessness.

Process-based Models of Burnout

Demand-control-(support) model. Karasek's Demand-Control model (1979) was originally developed as a stress-management model of job strain. The model asserts that mental strain is a result of the interaction between job demands and autonomy. According to Karasek, "the individual's decision latitude is the constraint which modulates the release or transformation of 'stress' (potential energy) into the energy of action" (p. 287). While Karasek originally identified job demands and job control as the essential job characteristics that influence an individual's well-being, the model was later adapted by Johnson and Hall (1988) to include social support. The Job-Demand-Control-(Support) model does not explicitly use the term "burnout" since burnout would be considered an outcome variable and the model's focus is on the process by which mental strain occurs rather than what mental strain leads to (Häusser, Mojzisch, Niesel, & Schulz-Hardt, 2010). The model is included in this review because it has been applied to the construct of burnout throughout the literature (Demerouti, Bakker, de Jonge, Janssen, & Schaufeli, 2001; Shirom, Toker, Berliner, & Shapira, 2008; Armon, 2009; Flynn & James, 2009; Joudrey & Wallace, 2009; Häusser et al., 2010; Marchand & Durand, 2011; Pinto,

Dawood, & Pinto, 2014; Lin, Wong, & Ho, 2015) and because the process by which mental strain occurs could arguably be considered an accurate definition of burnout.

Cherniss. According to Cherniss (1980), burnout refers to a "loss of enthusiasm, excitement, and a sense of mission in one's work" (p. 16). Cherniss characterized burnout as a type of psychological withdrawal that results from chronic stress. The model proposed by Cherniss (1995) identified individual, organizational, and societal sources of burnout and included a three-step process of burnout consisting of work stress, strain, and defensive coping. Cherniss stated that work stress is characterized by an imbalance between an individual's resources and demands. Strain is characterized in this model as consisting of exhaustion, fatigue, irritability, and tension. Defensive coping, according to this model, is how a person responds to the strain and is characterized by changes in attitudes and behavior such as withdrawal, cynicism, and detachment.

Edelwich and Brodsky. In their work on burnout, Edelwich and Brodsky (1980) described burnout as "a progressive loss of idealism, energy, and purpose experienced by people in the helping professions as a result of the conditions of their work" (p. 14). They presented a model of burnout which consists of four progressive stages – enthusiasm, stagnation, frustration, and apathy. The general premise of this model is that burnout arises as a result of idealistic expectations being unfulfilled by the reality of one's work, particularly frustrations such as low pay, unclear measurements of accomplishment, inadequate support from the organization, low social status, and poor career opportunities. These frustrations diminish the initial enthusiasm and lead to a reduction in expectations. At the end stage of burnout, according to Edelwich and Brodsky, the individual withdraws mentally from work, which may give rise to emotional

detachment, cynicism, or an actual physical withdrawal from the work in the form of absenteeism or turnover.

Muldary. Muldary (1983) defined burnout as "the process by which a once-committed health professional becomes ineffective in managing the stress of frequent emotional contact with others in the helping context, experiences exhaustion, and, as a result, disengages from patient, colleagues, and the organization" (p. 12). According to Muldary, there are characteristics of individuals that may predispose them to burnout. For example, Muldary asserts that health care professionals tend to exhibit a high degree of empathy, which can lead to a high degree of distress when their patients are suffering. Another example provided by Muldary is the perfectionism that can be found in some health care professionals. He indicated that the detail-oriented nature of these individuals often leads to a focus on productivity at the expense of meaningful relationships and leisure activities.

Golembiewski phase model. Golembiewski et al. (1986) stated that burnout derives from the presence of stressors that overwhelm the individual's ability to cope and the absence of positive job features such as organizational support and autonomy. Their phase model agreed with the dimensions of the MBI but proposed that depersonalization occurred first as an attempt to deal with the distress associated with work, with a reduction in personal accomplishment following, and finally full-blown emotional exhaustion. The model included eight phases that consisted of all possible combinations of high and low scores on the three dimensions of the MBI (i.e., depersonalization low or high, personal accomplishment low or high, and emotional exhaustion low or high). The authors indicated that an individual does not necessarily progress through all phases, but each phase is considered progressively worse depending on which

domains are elevated – emotional exhaustion is considered the most important dimension, followed by personal accomplishment, and then depersonalization.

Burisch. According to Burisch (1993), burnout is a "generic name for certain ill-defined types of crises." He goes on to say that it is a "fuzzy set of symptoms or a fuzzy set of people with symptoms" (p. 76). In reviewing the burnout literature at the time, Burisch identified six core symptoms of burnout: hyper- or hypoactivity; feelings of helplessness, depression, and exhaustion; inner unrest; reduced self-esteem and demoralization; deteriorating social relationships; and some active striving to elicit change. Burisch stated that burnout starts when a central aspect of autonomy has been lost, or the loss is pervasive across many areas. He indicated that all burnout symptoms could be viewed as either direct effects of losing autonomy or as attempts to regain autonomy, prevent further loss of autonomy, compensate for the loss of autonomy, or to somehow lessen the perceived effect of the loss of autonomy. Burisch (1989, 1993) outlined an approach in which patterns of disturbed actions play a vital role in the progression of burnout. He suggested that individual events or actions when unsuccessfully or insufficiently completed, cause an initial level of stress that the individual must cope with. If that stress is unsuccessfully dealt with, the individual's sense of autonomy becomes threatened, leading to burnout. The patterns of action disturbance identified by Burisch included motive thwarting (i.e. obstacles that block goal attainment), goal impediment (i.e. the goal requires unexpectedly high efforts or demands, insufficient reward (i.e., the goal is attained, but the reward is disproportionate to the amount of effort or expectations), and unexpected adverse side effect (i.e. unintended and unforeseen negative consequences of obtaining the goal).

Conservations of resources. The conservation of resources theory, proposed by Hobfoll and Freedy (1993), posits that individuals have a motivation to obtain, retain, and protect valued resources, including objects, conditions, personal characteristics, and currency. According to the model, psychological distress occurs when resources are threatened, lost, or when the resource gain fails to match the resources invested. Individuals attempt to manage this distress by investing and allocating various resources, including social support. Ultimately, they assert that burnout occurs when coping is unsuccessful and when a net loss of resources is perceived that cannot be replenished. The conservation of resources model defines burnout as "a process of wearing out and wearing down of a person's energy, or the combination of physical fatigue, emotional exhaustion, and cognitive wear-out that develops gradually over time" (Hobfoll and Shirom, 1993, p. 50).

Effort-reward imbalance model. Similar to the Demand-Control-Support model (Karasek, 1979; Johnson and Hall, 1988), the Effort-Reward Imbalance model (Siegrist, 1996) does not explicitly mention burnout. The focus of this model is on job strain and claims that job strain is the result of an imbalance between an individual's level of effort and the reward that they receive, which leads to arousal and distress, and may lead to increased health risks such as cardiovascular problems (Siegrist, 1996). According to Siegrist, effort may include extrinsic demands and obligations as well as intrinsic coping and a need for control, while rewards may include money, esteem, and social roles within the workplace. This model has been applied to the concept of burnout throughout the literature and presumes burnout to be a consequence of job strain (Bakker, Killmer, Siegrist, and Schaufeli, 2000; Bellingrath, Weigl, and Kudielka, 2008; Fortunatti and Palmeiro-Silva, 2015; Jachens, Houdmont, and Thomas, 2018).

Schaufeli and associates. Schaufeli (1999) indicated that burnout "can be considered as a final stage in a breakdown in adaptation that results from the long-term imbalance of demands and resources" (p. 20). Schaufeli and Buunk (1996) state that "burnout begins with stress resulting from the discrepancy between, on the one hand, the individual's expectations and ideals, and, on the other, the harsh reality of everyday occupational life…Gradually, the individual starts to feel emotionally strained…" (p. 316). The authors primarily focused on organizing symptoms of burnout by reviewing several models of burnout. Their review resulted in six categorical groupings of symptoms and consequences – mental, physical, behavioral, social, attitudinal, and organizational. Of note, the authors assert that the mental, physical, and behavioral aspects of burnout are essentially characteristics of the stress response. What makes burnout unique, according to the authors, is the work-specific consequences, including changes in attitudes and ultimately the intention to quit. In 1998, Schaufeli and Enzmann reviewed the burnout literature and proposed the following synthesis of definitions:

> Burnout is a persistent, negative, work-related state of mind in 'normal' individuals that is primarily characterized by exhaustion, which is accompanied by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviors at work. This psychological condition develops gradually but may remain unnoticed for a long time for the individual involved. It results from a misfit between intentions and reality at the job. Often burnout is self-perpetuating because of inadequate coping strategies that are associated with the syndrome (p. 36).

In 2006, Schaufeli, drawing from Adams' equity theory (1965), proposed a social-exchange model of burnout. He indicated that the lack of reciprocity or unbalanced helping relationships drain the individual's emotional resources and causes emotional exhaustion. He posited that the

individual's initial response is to invest more effort to combat the stress, but the imbalance increases and causes resources to be further depleted. According to Schaufeli, investments in interpersonal relationships are decreased to reallocate resources, leading to depersonalization. Schaufeli also applied the theory to the organizational level, asserting that the individual reallocates resources that were invested in the relationship to the organization, leading to job dissatisfaction and lower organizational commitment.

Job demand resources. The job demands-resources model of burnout (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) proposed that burnout develops as challenging aspects of work lead to continuous exertion and subsequently exhaustion. They assert that a lack of resources can hinder an individual's ability to meet work demands, leading to further withdrawal behaviors and ultimately disengagement from work. This model defines job demands as the "physical, social, or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs (e.g., exhaustion)" (Demerouti et al., 2001, p. 501). Job resources are defined as the "physical, psychological, social, or organizational aspects of the job that may do any of the following: (a) be functional in achieving work goals, (b) reduce job demands at the associated physiological and psychological costs; (c) stimulate personal growth and development" (p. 501).

Comparisons of Burnout Definitions

According to Manzano-García and Ayala-Calvo (2013), "A conclusion that can be drawn from the historical review of the burnout concept is that the definitions of burnout are complementary rather than conflicting with one another; and that they can be regrouped depending on whether the phenomenon is considered as a state or as a process" (p. 802). In reviewing the burnout literature, there appear to be three main similarities that can be

extrapolated from the various models and definitions. These similarities are a shared reference to a stress response, a framework that highlights the relationship between an individual's resources and demands, and the inclusion of conceptual elements related to the individual, interpersonal relationships, and external factors.

Stress response. Weber & Jaekel-Reinhard (2000) stated that "It is generally believed today that 'negative stress' (distress) probably represents a key phenomenon in the aetiopathogenesis of burnout" (p. 512). This quote summarizes one of the main observations in reviewing the models and definitions of burnout – all of them refer to a stress process. While the term "stress" has been criticized for being "used inconsistently across disciplines" (Cohen, Gianaros, & Manuck, 2016) and from a lack of agreement on its meaning (Kagan, 2016), an in-depth exploration and precise operationalization of the term is beyond the scope of this paper. For the sake of simplicity, "stress" will be defined, based on the broad descriptions provided by McEwen (2000) and Cohen et al. (2016), as a process by which perceived demands, threats, or events elicit physiological, psychological, and behavioral responses in an individual.

In reviewing the state-based models and definitions of burnout, it is clear that they contain either implicit or explicit references to a stress process. Freudenberger's (1975) reference to burnout as a state of fatigue or exhaustion can be seen as an allusion to the physiological aspect of the stress response, with the frustration regarding failure to achieve objectives representing the demands or threats that elicit said response. Likewise, Pines and Aronson (1988) refer to exhaustion and a failure to achieve in their definition of burnout. Potter's (1998) mention of fatigue and motivation can be seen to represent the respective physiological and psychological aspects of the stress response. Meier (1983) and Farber (1991) refer to a discrepancy between an individual's effort and the reward received, which can be seen

to represent the demands or threats of the stress response. Finally, Maslach (2018), Perlman and Hartman (1982), Brill (1984), and Figley (1995) all explicitly mention the word "stress" in their definitions and models of burnout.

According to Schaufeli and Buunk (1996), "most process definitions of burnout maintain that burnout begins with stress…" (p. 316). Among the process-based models and definitions, the demand-control(-support) model (Karasek, 1979; Johnson and Hall, 1988), Cherniss (1980), Muldary (1983), Golembiewski et al. (1986), Burisch (1993), the effort-reward imbalance model (Siegrist, 1996), and Schaufeli and associates (Scaufeli and Buunk, 1996) all explicitly mention "stress." Edelwich and Brodsky (1980) refer to frustrations such as low pay and inadequate support, which can be seen to represent the demands of the stress response. Their reference to a loss of energy, cynicism, and absenteeism can be seen to represent the physiological, psychological, and behavioral aspects of stress, respectively. The conservation of resources model (Hobfoll and Freedy, 1993) references psychological distress, threatened resources, loss of energy, fatigue, exhaustion, and cognitive difficulties, which all represent aspects of a stress process. The job demand resources model (Demerouti et al., 2001) is characterized by references to the stress process as it maintains an emphasis on demands, references exhaustion, and discusses consequences including withdrawal behaviors.

Resources and demands. While the job demand resources model (Demerouti et al., 2001) provides a framework of resources and demands, it does so in a job-exclusive manner. That is to say, the model only includes resources and demands that are "aspects of the job." In a broader sense though, the models and definitions of burnout appear to follow a general framework that juxtaposes an individual's resources and demands. In regards to the state-based models and definitions of burnout, Freudenberger's model (1975) appears to consist of resources

such as the commitment an individual makes to a cause, objectives one aims to achieve, relationships, and expectations, while his model appears to include demands such as overwork, internal and external pressures, and the failure to achieve objectives and meet expectations. While Meier (1983) and Brill (1984) similarly focus on expectations as resources and the failure to meet said expectations representing demands, Meier places a greater focus on reinforcement as the process by which resources interact with demands. For Maslach (2018), resources appear to include work engagement, efficacy, interpersonal connectedness, and general coping skills, while demands appear to include emotionally draining social interactions, interpersonal stress, and chronic exposure to stressful work situations. Perlman and Hartman (1982) identified five categories of burnout variables that each included both demands and resources. Among the variables listed caseload, leadership, support, autonomy, work pressure, meaningfulness of work, tenure, and satisfaction can all be considered demands or resources depending on the circumstances. Pines and Aronson (1988) present engagement, meaning-making, and general coping abilities as resources, while demands include an inability to manage stress, failure of the job to meet the individual's needs, and the loss of resources as a result of being exhausted. Resources, according to Farber (1991) include perceptions of reward, self-esteem, and general coping, while demands include a discrepancy between effort and reward, demanding clients, and similarly to Pines and Aronson (1988), lost resources as a result of exhaustion. According to Figley (1995), resources can include empathy, general coping, and interpersonal connectedness, while demands can include occupational hurdles, stress generated by the agency, and the loss of resources as a result of chronic empathy. Finally, Potter (1998) provides a framework for burnout in which resources consist of satisfaction, meaning, and general coping abilities,

whereas demands consist of any job aspects that reduce efficiency, negatively impact motivation, and diminish an individual's perception of capability concerning coping.

The process-based models and definitions of burnout also appear to follow an oppositional framework of resources and demands. The demand-control(-support) model (Karasek, 1979; Johnson and Hall, 1988) is relatively self-explanatory, as resources consist of job autonomy and decision latitude and demands consist of job demands such as workload, conflicts, and time constraints. Cherniss' model (1980) is even more self-explanatory as it explicitly states that work stress is the result of an imbalance between the individual's resources and demands. Edelwich and Brodsky (1980) include resources such as excitement, idealism, energy, purpose, and general coping ability, as well as demands such as low pay, unclear expectations, inadequate support, and a lack of career opportunities. Muldary (1983) and Golembiewski (1986) also frame general coping ability as a resource. For Muldary, other resources include commitment and the helping context of the work an individual does, whereas Golembiewski includes organizational support and autonomy as resources. Both models include the inability to manage stress as a general work demand. Burisch (1989, 1993) presents a model that considers goals, rewards, relationships, self-esteem, and coping ability as resources. Demands, according to this model, include obstacles that block an individual's goals, a general discrepancy between one's effort and rewards, negative consequences of a goal, and the resources lost as a result of becoming exhausted. According to the conservation of resources model (Hobfoll and Freedy, 1993), resources include objects, conditions, personal characteristics, and currency. Demands are represented by the loss of resources and the perception that losses are permanent. The effort-reward imbalance model (Siegrist, 1996) proposes that resources consist of money, esteem, and social roles, while demands consist of

work obligations and a discrepancy between the level of effort put forth and the reward that is received. Finally, Schaufeli frames resources as consisting of expectations and ideals (Schaufeli and Buunk, 1996), as well as reciprocity in relationships (Schaufeli, 2006), whereas demands consist of the inability to effectively manage stress and the loss of resources (Schaufeli and Buunk, 1996; Schaufeli, 2006).

Domains. In reviewing the burnout literature, several conceptual elements emerge consistently across both state-based and process-based definitions and models. These conceptual elements can be broadly categorized across three domains – intrapersonal, interpersonal, and extrapersonal. The intrapersonal domain consists of the mental and physical aspects of the individual. Mental aspects might include cognitions, emotions, and personality, whereas physical aspects may include the individual's body, physiology, and behaviors. The interpersonal domain consists of relationships, interactions with co-workers and clients/customers/recipients, and perceived support. The extrapersonal domain consists of external factors such as the physical environment, the organization, society, and the world in general.

The intrapersonal domain refers to elements that are specific to the individual, such as one's thoughts, feelings, and behaviors. It can also refer to the physiological responses of the individual's body, specifically related to the stress response. Beginning with state-based models and definitions, Freudenberger's conceptualization of burnout (1974) refers to mental aspects of frustration, pressure, emotional exhaustion, devotion, and expectations. Physical aspects captured by Freudenberger include fatigue, physical exhaustion, and behaviors such as working long hours or working too intensely. Maslach (Maslach and Jackson, 1981) includes mental aspects related to exhaustion, feelings of being drained, and reduced perceptions of professional

efficacy, as well as physical aspects of reduced physical energy, physical exhaustion, and changes in behaviors at work. Perlman and Hartman (1982) refer to mental aspects related to emotional exhaustion, ego level, and satisfaction and physical aspects such as physical exhaustion and behavioral outcomes such as turnover. Meier's model (1983) focuses on the personal characteristics of the individual and includes mental aspects related to "wrong expectations," level of effort, unpleasant feelings, and perceptions of personal competence. Physical aspects in this model refer most specifically to unproductive behaviors that result from the pattern of unmet expectations. Brill (1984) includes mental aspects of dysphoria and expectations and the physical aspect of behavioral changes associated with declines in work performance. Pines and Aronson (1988) refer to mental exhaustion consisting of negative attitudes, emotional exhaustion including feelings of helplessness and hopelessness, and physical exhaustion consisting of loss of energy, weakness, and fatigue. Farber (1991) explicitly mentions individual factors which include mental aspects such as perceptions of a discrepancy between effort and rewards, anxiety, sadness, and lowered self-esteem, as well as the physical aspects of withdrawal behaviors and physical exhaustion. Figley's (1995) conceptualization of burnout includes symptoms related to mental aspects including impaired concentration, preoccupation with traumatic thoughts, feelings of guilt, anger, fear, sadness, existential concerns, loss of hope, and a loss of purpose. Physical symptoms include perspiration, increased respiration, sleep disturbances, increased pulse, muscle aches, shortness of breath, dizziness, disorientation, and behavioral changes such as eating problems and proneness to accidents. Potter (1998) refers to mental aspects such as frustration, depression, and feelings of injustice. Physical aspects include health problems, reduced efficiency at work, and potential substance abuse problems.

The models and definitions of burnout reviewed also contain an interpersonal domain, which includes interactions, relationships, and perceived support. Freudenberger (1974) posits that burnout can result from pressures coming from clients and administrators. It has been said that Freudenberger and Maslach see burnout as a product of "rapid change in social relationships" (Schaufeli, Leiter, and Maslach, 2008). Maslach's model of burnout explicitly highlights the interpersonal domain in the dimension of depersonalization, which refers to a detachment from others. The other state-based models and definitions of burnout, including Perlman and Hartman (1982), Meier (1983), Brill (1984), Pines and Aronson (1988), Farber (1991), Figley (1995), and Potter (1998) all reference some form of interpersonal withdrawal, isolation, and cynicism as a critical component of the burnout condition.

Likewise, the process-based models and definitions of burnout all reference some form of interpersonal domain. The demand-control(-support) model (Karasek, 1979; Johnson and Hall, 1988) includes social network and social interactions as part of the model, with the implication that low work social support is a contributing factor to the progression of the burnout process. Cherniss (1980, 1995) refers to problems with clients, a lack of collegiality, and social isolation as potential consequences characteristic of burnout, while Burisch (1993) makes mention of deteriorating social relationships as a critical component of the burnout process. Edelwich and Brodsky (1980) posit that interpersonal contact is central to the development of burnout, with inadequate support and low social status being implicated as major contributors and detachment and cynicism being implicated as outcomes. Muldary's definition of burnout (1983) suggests that emotionally draining interpersonal interactions is a central contributor to burnout and ultimately leads to disengagement from patients and co-workers. Like Maslach's model of burnout, Golembiewski's model (Golembiewski et al., 1986) features depersonalization as a

critical component of the burnout process. The conservation of resources model of burnout (Hobfoll and Freedy, 1993) theorizes that social support is a resource and that withdrawing from others is a coping strategy employed when resources are threatened. The theory suggests that individuals reallocate resources from less important areas to focus on more essential domains, such as withdrawing from others in order to maintain personal coping resources.

Similarly, Schaufeli's social-exchange model (2006) maintains that investments in relationships are decreased in order to reallocate resources, which accounts for the presence of depersonalization in the burnout process. According to the effort-reward imbalance model (Siegrist, 1996), belonging to a significant group is a benefit that comes with a balance of effort to reward. The model considers social roles as rewards and suggests that an imbalance between effort and rewards leads to decreased feelings of belonging. Finally, the job demand resources model (Demerouti et al., 2001) explicitly includes social aspects of the job as both potential resources and potential demands.

The final domain that is consistent across burnout models and definitions is the extrapersonal domain. Extrapersonal refers to aspects that are external and beyond the person or persons. This domain is easily represented by all definitions and models of burnout because each essentially contains some reference to the relationship between the individual and the job or organization, which would be considered an external factor. All models of burnout refer to work/organizational commitment, work engagement, job satisfaction, work environment, or organizational factors. Aside from the work context that is inherent to burnout, the extrapersonal domain is represented in other ways among the models and definitions reviewed. Freudenberger (1974) indicated that one's devotion to a cause, which can be considered an external factor, is a contributing factor to the development of burnout when it fails to yield the expected reward.

Other models and definitions, including Cherniss (1980, 1995), Farber (1991), and Schaufeli and Buunk (1996) not only included organizational factors contributing to burnout, but they also highlighted various societal factors. Furthermore, Figley (1995) explained how burnout could influence an individual's relationship to the world through the development of existential concerns, loss of hope, anger with the divine, and a loss of purpose.

This extensive exploration of the burnout literature provides some insight into the commonalities shared amongst the prevalent models. Whether burnout is conceptualized as a dichotomous state or a continuous process, it appears that all prominent definitions of burnout refer to a stress response, utilize some form of resource and demand framework, and consist of domains related to the individual (i.e., intrapersonal), relationships with others (i.e., interpersonal), and the individual's relationship to external factors such as work, the organization, and the environment. These commonalities might allow for a more comprehensive theoretical foundation for the burnout construct. Further exploration of the stress response – one of the commonalities mentioned above – appears necessary in order to substantiate the identified conceptual elements.

CHAPTER IV: REVIEW OF STRESS LITERATURE

With the models and definitions of burnout reviewed and evaluated for conceptual similarities, it is essential to turn to the stress literature in order to better understand the physiological underpinnings that are implicated in the development and progression of burnout. By exploring the stress literature, it may become possible to identify relationships between conceptual elements of the various burnout definitions and identifiable neurophysiological changes that occur in response to stress, thereby providing a solid theoretical foundation to build upon. The primary goal of this section is to examine the neurophysiology of the stress response, particularly the chronic stress response, to lay the foundation for making comparisons to the previously reviewed elements of burnout.

History

In order to fully appreciate the stress process as it is currently understood, it is important to take at least a brief look at how stress research has progressed. Walter Cannon, the first professor of physiology at Harvard University, is considered a significant figure in stress research (Lovallo, 2015). Cannon was concerned with how the body responds to changes in the environment in order to allow for optimal bodily functioning. He referred to the process of maintaining internal stability in response to environmental changes as homeostasis, and he coined the phrase “fight or flight” in reference to the physiological response to threat (Cannon, 1929). While Cannon is thought to be one of the first to use the term stress in reference to bodily demands and responses, it is the work of Hans Selye that is mostly thought to have brought the concept of stress into the spotlight (Lovallo, 2015).

Selye, known as the "father of stress research," defined stress as a "nonspecific response of the body to any demand" (Tan & Yip, 2018, p. 170). In his experimental work with animals, Selye noticed a particular set of physiological responses that occurred regardless of the environmental challenge or stressor (Selye, 1956). He referred to this pattern of core stress responses as the *general adaptation syndrome*. Selye also identified three stages by which this pattern of responses would progress. He identified an *alarm* reaction in which the organism recognizes the threat, a stage of *resistance* in which the organism underwent metabolic changes in order to promote survival, and, if the organism could not resolve the stressor and return to a state of homeostasis, an *exhaustion* stage in which the organism would no longer be able to respond to the stress adequately and would ultimately die (Lovallo, 2015).

An assumption implied in the concept of homeostasis is that the organism would return to a resting or pre-stress state upon responding to a stressor. However, Sterling and Eyer (1988) observed that under exposure to moderate stress, an organism might only be able to achieve homeostasis through continued variations in the physiological system of the organism. The idea that maintaining homeostasis might require the organism's systems to fluctuate in response to demands was referred to as *allostasis.* McEwen and Stellar (1993) expanded on the idea of allostasis and highlighted how maintaining homeostasis could be a source of strain on the organism under continual stress, as the physiological system of the organism is forced to adapt continuously. They also introduced the term *allostatic load*, referring to the "wear and tear" that occurs over time as a result of adaptation. Examples of allostasis include changes in blood pressure throughout the day, changes in food intake and metabolism in females during lactation, shifts in metabolisms and patterns of behavior in migrating birds, and the inhibition of secondary

processes not essential for survival (e.g., reproduction) during distress (McEwen & Wingfield, 2003).

Neurophysiology of the Stress Process

Progression. In reviewing the history of stress research, there appear to be short-term and long-term processes involved in the stress response, depending on the chronicity of the stressor and the organism's ability to effectively respond to the said stressor. Considering the implication in the burnout literature of chronic distress driving the development and progression of the condition, it is essential to explore both the short-term and long-term processes involved. As such, this section will explore the neurophysiology of short-term distress as well as the more long-term adaptation of allostasis.

According to prevalent theories, the stress process begins with the perception of some stimuli as a potential stressor, is followed by an appraisal of the stimuli, and then a response depending on the appraisal (Lazarus & Folkman, 1984; Lovallo, 2015; Seaward, 2015). Neurologically, information is sent to the thalamus, which then directs the information to other cortical areas (Carlson & Birkett, 2016). Information travels by two pathways, a 'high-road' by which information travels through a series of association areas and is elaborated and connected with stored memories, and a 'low-road' by which information travels directly to the amygdala (Lovallo, 2015), an area of the brain that is associated with threat detection, vigilance regulation, emotional memory, fear conditioning, and emotional recognition and regulation (Carlson & Birkett, 2016; Pinel, 2017; van Marle, Hermans, Qin, & Fernandez, 2009; Veer et al., 2011). As the information travels, it is also made available to the hippocampus, an area of the brain associated with memory, learning, contextual fear conditioning, and spatial memory (Carlson & Birkett, 2016; Pinel, 2017). The information then travels to the anterior cingulate gyrus and

eventually comes together at the prefrontal cortex (PFC) and the outputs of the limbic system, referred to as *frontal-limbic* connections (Lovallo, 2015). These connections, which include the inferior temporal lobe, basal forebrain, and ventromedial prefrontal cortex (vmPFC), are involved in the assigning of affective meaning to stimuli – also referred to as an appraisal process – and the subsequent generation of emotions (Lovallo, 2015). According to Lovallo (2015), this area appears to be where inputs begin to obtain motivational significance and where they "give rise to conscious awareness of the relationship between contextual cues in light of prevailing motivational context" (p. 105).

Once a potential stressor is detected through sensory channels, the information is processed, and an appraisal can be made (Scherer, 2009). According to the cognitive appraisal theory (Lazarus and Folkman, 1984), individuals undergo primary and secondary appraisals when faced with a potential stressor. The primary appraisal relates to how relevant and how threatening a stressor is and is influenced by one's beliefs and commitments as well as learning history (Lovallo, 2015). If a potential stressor is irrelevant or benign, it is ignored, and no further response is necessary (Lovallo, 2015). If a potential stressor is relevant an appraisal of threat occurs, which can result in one of three classifications (Matthieu & Ivanoff, 2006). According to Lazarus and Folkman (1984), a threat appraisal occurs if there is the potential for future harm, while a harm/loss appraisal occurs if the perceived harm or injury has already occurred. If the stressor presents an opportunity for some benefit, growth, or development, a challenge appraisal is made (Smith & Kirby, 2011).

The secondary appraisal relates to the individual's resources, particularly control (Folkman, 1984) and the effectiveness of available coping strategies (Lazarus & Folkman, 1984). While they do not necessarily occur in sequential order, the primary appraisal determines

whether the stress response is necessary (Smith & Kirby, 2011), while the secondary appraisal determines whether the threat can be compensated for or mitigated (Ganzel et al., 2010). Following the appraisal, the stress response occurs accordingly, along with some attempt at coping. Coping may focus on either solving the problem causing the distress or on regulating the distressing emotions that occur. Finally, a reappraisal of the coping strategy and resolution of the stressor occurs (Lovallo, 2015).

Expanding on the cognitive appraisal theory, the component process model (Moors & Scherer, 2013) includes four domains of the appraisal process. Moors & Scherer (2013) describe the first domain, relevance, as consisting of the novelty, intrinsic pleasantness, and the goal congruence of the potential stressor. The authors implicate attention, memory, and motivation as essential variables contributing to this domain. The next domain, implication, includes causality, estimated outcome, expectations, and urgency (Moors & Scherer, 2013). The third domain, coping, includes control, power, and adjustment (Moors & Scherer, 2013). The final domain is normative significance, which is an overall assessment of how the potential stressor aligns with the individual's self-concept, values, social norms, and rules (Scherer & Moors, 2019). Subcomponents of the component process model include central and peripheral physiological responses, action tendencies, and fairness (Scherer & Moors, 2019).

Appraisals can be automatic processes, particularly regarding primary appraisals, or they can be highly cognitive planned responses, particularly regarding secondary appraisals (Lovallo, 2015). The appraisal process appears to be iterative and occurs through a low-road and high-road (Lewis, Haviland-Jones, & Barrett, 2016). The low-road of appraisal is implicit, while the high-road is evaluative in order to make sure low-road responses are accurate (Lewis et al.,

2016). The process is considered iterative because continual shaping from high-road appraisals influences future low-road responses over time (Ganzel et al., 2010; Lewis et al., 2016).

There appears to be neurophysiological support for the appraisal process. The hippocampus and amygdala are structures that interpret the threat level of a stimulus and determine the physiological responses (Sapolsky, 2004). Specific brain regions experience changes in activation based on an individual's perception of control (Abelson, Khan, Liberzon, Erickson, & Young, 2008; Amat, Paul, Watkins, & Maier, 2008; Gaab, Rohleder, Nater, & Ehlert, 2005). Furthermore, perceptions of psychosocial resources can inhibit cortisol responses during threat regulation (Taylor et al., 2008). Finally, cognitive appraisal strategies can influence cortisol levels (Denson, Spanovic, & Miller, 2009) improve performance (Gildea, Schneider, & Shebilske, 2007), and reduce the experience of negative affect by changing activity levels in brain regions associated with emotional regulation (Urry et al., 2006).

Once an appraisal is made, autonomic and endocrine systems – the two central systems of communication that regulate organ function – initiate responses via the hypothalamus (Lovallo, 2015). The hypothalamus activates the sympathetic nervous system – a part of the autonomic nervous system – through the adrenal medulla, resulting in the release of epinephrine and norepinephrine into the bloodstream (Lovallo, 2015). Epinephrine, one of two major stress hormones, mobilizes the body's available energy resources by increasing heart rate, blood pressure, and blood sugar (Ganzel, Morris, & Wethington, 2010). This initial neuroendocrine response, commonly referred to as the *fight-or-flight response* (Lovallo, 2015), provides quick physiological adaptation in order to immediately handle potential threats (Godoy, Rossignoli, Delfino-Pereira, Garcia-Cairasco, & de Lima Umeoka, 2018). The pathway from the

hypothalamus to the adrenal medulla is referred to as the sympathetic adrenomedullary (SAM) axis.

The paraventricular nucleus (PVN) of the hypothalamus is involved in both autonomic and endocrine regulation, making it a central component of the stress system (Tsigos et al., 2000). Regarding endocrine regulation, the PVN is involved in the secretion of corticotropin-releasing hormone (CRH), which causes a cascade in which adrenocorticotropic hormone (ACTH) is secreted from the pituitary gland (Tsigos et al., 2000). This cascade then stimulates the anterior adrenal cortex and leads to the secretion of glucocorticoids, including cortisol (Carlson & Birkett, 2016). The PVN, pituitary gland, and adrenal cortex make up the commonly referenced hypothalamic-pituitary-adrenocortical (HPA) axis (Lovallo, 2015). Following the activation of the stress process, the HPA axis is regulated, primarily through negative feedback by cortisol in the anterior pituitary gland, the PVN, and the hippocampus (Smith, 2006). This negative feedback process acts to return the HPA to its basal activity level – assuming the stressor is resolved (Stephens, 2012). The HPA can also be regulated by the hippocampus and PFC and activated by the amygdala (Lovallo, 2015; Smith, 2006). The activation and regulation of the stress response may correspond to subsequent thoughts, emotions, and behaviors in response to the stressor, which may be accompanied by appraisals of the responses and then recursive engagement of the stress response again (Lovallo, 2015). The HPA axis is considered the longer-term stress response compared to the SAM axis, which has a more immediate impact (Godoy et al., 2018).

Cortisol. The secretion of cortisol has important implications in the stress process, with cortisol levels being the most commonly utilized physiological measure of stress (Pinel & Barnes, 2017). While moderate levels of cortisol are necessary to regulate normal cell functioning, increased levels of cortisol during periods of stress help to regulate the stress process (Cranston, 2014; Lovallo, 2015). Cortisol has significant effects on glucose metabolism, blood flow, the breakdown of proteins, and the stimulation of behavioral responsiveness (Carlson & Birkett, 2016). From a survival perspective, cortisol helps to mobilize energy reserves, shut down processes that are unnecessary to immediate threat response, and prepare the body for fighting or fleeing (McEwen, 2000). Through negative feedback to the hypothalamus, pituitary gland, and hippocampus, cortisol regulates itself and attempts to return to basal levels as it acts on these areas to suppress the HPA axis (Cranston, 2014; Lovallo, 2015). This process, by which cortisol fluctuates to meet the needs of the physiological system, is an example of allostasis – the process of physiological adaptation in order to maintain stability (McEwen, 2010).

While the short-term effects of cortisol are vital to regulating general functioning, prolonged secretion can have deleterious results (Carlson & Birkett, 2016; Juster, McEwen, & Lupien, 2010). Long-term cortisol secretion has been associated with hypertension, weight gain, diabetes, gastrointestinal dysfunction, ulcers, suppression of the immune system, Cushing syndrome, and cardiovascular disease (Carlson & Birkett, 2016; Hammer & Stewart, 2006; Juster, McEwen, & Lupien, 2010; Korte, Koolhaas, Wingfield, & McEwen, 2005; Lovallo, 2015; Manenschijn et al., 2013; McEwen, 2008; McEwen & Gianaros, 2010; Pinel & Barnes, 2017; Sapolsky, 2004; Whitworth et al., 2001). For example, cortisol facilitates increased blood pressure, which is helpful for escaping a short-term threat, but ultimately damages arteries over

time if chronically elevated, leading to atherosclerosis and increasing risk of heart attack and stroke (McEwen, 2000; Sapolsky, 2004). This is an example of allostatic load, the "wear and tear" that occurs on the physiological system as a result of chronic utilization of adaptation mechanisms that are only intended for short-term use (McEwen, 2000). As Sapolsky put it (2004), "a large body of evidence suggests that stress-related disease emerges, predominantly, out of the fact that we so often activate a physiological system that has evolved for responding to acute physical emergencies" (p. 6).

Brain regions. While the physiological effects of chronically elevated cortisol are notable, there are specific neurological implications that are important to explore. Neurologically, the areas of the brain most associated with the stress process include the amygdala, hippocampus, and PFC (Ganzel et al., 2010). The amygdala, the area of the brain involved in the "acquisition, storage, and expression of conditioned fear" (Pinel, 2017) and generally thought of as the "center of emotional experience" (Lovallo, 2015), becomes hypersensitive when exposed to chronically-elevated levels of cortisol (Ganzel et al., 2010; Lovallo, 2015; McEwen & Gianaros, 2011). Chronic stress promotes dendritic growth in neurons in the basolateral amygdala and decreases the ability of the hippocampus and PFC to regulate fear inhibition (McEwen & Gianaros, 2011). Glucocorticoid hormones, particularly cortisol, also strengthen the consolidation of emotionally arousing memories (Roozendaal et al., 2009).

From a survival standpoint, this adaptation appears reasonable. If the organism is in an environment that presents frequent threats, it stands a better chance at surviving if it can detect a threat more quickly. The organism also has a better chance at surviving if it can store information regarding the current threat for future reference and recall similar threats from

memory and previous courses of action that helped it survive. Therefore, an amygdala that is more sensitive to threats and that can consolidate emotional memories more easily would, at least in theory, give the organism an advantage in that environment.

The problem with this adaptation is that the increased sensitivity comes at the cost of decreased specificity, resulting in "unnecessary, metabolically demanding responses to innocuous stimuli" (van Marle et al., 2009, p. 649). Furthermore, the increased ability to consolidate emotionally arousing memory may promote "disproportionate memory consolidation of negative experiences" and may "form a basis for unwanted intrusive memories" (Veer et al., 2011, p. 1538).

While the amygdala appears to experience neuronal growth as a result of chronically elevated cortisol, other brain regions associated with the stress process, including the hippocampus and PFC, experience dendritic shrinking as a result of prolonged cortisol exposure (Conrad, 2008; Cranston, 2014; McEwen, Nasca, & Gray, 2016). The hippocampus, which is primarily involved in learning and memory (Conrad, 2008; Preston & Eichenbaum, 2013) is considered "the primary site of negative feedback for cortisol regulation" (Lovallo, 2015, p. 126). Interestingly, it appears that the hippocampus decreases in activation during the initial onset of a stressor, which has been hypothesized as being a way to reduce noise while encoding and increase memory performance (Henckens et al., 2009). As cortisol continues to be released, however, hippocampal activity increases as cortisol works to suppress the HPA and regulate itself (Conrad, 2008). Chronic cortisol exposure leads to glucocorticoid receptors in the hippocampus being down regulated, inhibiting the hippocampus' ability to provide feedback to the HPA (Cranston, 2014). As cortisol becomes more elevated for more prolonged periods of time, the hippocampus becomes less able to regulate it, leading to more cortisol and subsequently

lowered the regulatory capabilities of the hippocampus (Conrad, 2008). Ultimately, the chronic exposure to cortisol causes volume loss and atrophy in the hippocampus and impairs the hippocampus' ability to regenerate cells (Cranston, 2014; McEwen, 2010).

The PFC, an area of the brain associated with top-down regulation of behavior, thought, and emotion, experiences a decrease in activation during the stress process (Arnsten, Raskind, Taylor, & Connor, 2015). As a result of this decrease in activation, there are decreases in concentration, short-term memory, rational thought, inhibition, and working memory (Arnsten et al., 2015; Barsegyan, Mackenzie, Kurose, McGaugh, & Roozendaal, 2010). Interestingly, elevated cortisol in the PFC appears to enhance memory consolidation (Barsegyan et al., 2010). From a survival standpoint, this adaptation appears reasonable. During an acute threat, it is vital for an organism to be able to act quickly, making abstract reasoning and deliberate decision making less important for that moment. Improved memory consolidation might be beneficial to an organism in order to encode information about the threat to be better prepared if ever faced with that threat again. Unfortunately, chronically elevated cortisol leads to rapid impairment of the PFC, which weakens its ability to regulate the stress response, and subsequently makes the amygdala stronger and more reactive (Arnsten et al., 2015; Dedovic, Duchesne, Andrews, Engert, & Pruessner, 2009; McEwen, 2008; McEwen, Nasca, & Gray, 2016; Sauro, Jorgensen, & Pedlow, 2003).

Finally, the anterior cingulate cortex (ACC), a brain region typically considered part of the PFC, is implicated in the regulation of the amygdala and is involved in inhibiting the HPA response to stress (Stark et al., 2006). The ACC is also involved in processing information related to mood and pain (Sellmeijer et al., 2018), as well as error processing and monitoring, monitoring of performance, and processing of conflict (Weston, 2012). During acute stress, the

ACC experiences increased activation to regulate the stress response (Sellmeijer et al., 2018). Unfortunately, under conditions of chronically elevated cortisol, the ACC eventually becomes hypo-reactive and is less able to regulate the HPA (Boehringer et al., 2015). This dysregulation further strengthens the amygdala's influence and reduces top-down regulatory functions of the PFC (Hakamata et al., 2017). Individuals who experience chronic stress typically exhibit smaller cortical volume in the ACC and other regions of the PFC (Ansell, Rando, Tuit, Guarnaccia, & Sinha, 2012).

Allostasis. The stress response has developed a negative connotation, which is not necessarily accurate (Karatsoreos & McEwen, 2011). The concept of allostasis appears to capture the stress process more neutrally, accounting for both positive and negative aspects of adaptation (Karatsoreos & McEwen, 2011). Described as an active process of adaptation to changes in the environment, allostasis is different from homeostasis mainly because it incorporates learning and anticipatory responses, which are absent in the general concept of homeostasis (Ramsay & Woods, 2014). The stress response, according to Cannon (1929), was initially framed as striving to return the system to its original homeostatic state. With the introduction of allostasis, Sterling & Eyer (1988) took the stance that the stress response acts not to return to basal homeostasis. Instead, it attempts to accommodate to the stressor by establishing new homeostasis that better fits the circumstances (Ganzel & Morris, 2011).

The concept of allostasis appears to provide a framework for understanding longer-term adaptation, particularly through anticipatory mechanisms (Schulkin, 2010). While feedback processes are important, they are not entirely efficient by themselves (Ramsay & Woods, 2014). When perturbations in a system can be anticipated, it is possible to reduce the impact using predictive feedforward processes (Del Giudice et al., 2018; Ramsay & Woods, 2014). Like most

biological regulatory systems, allostasis features predictive and reactive elements (Del Giudice et al., 2018; Schulkin, 2010). The predictive elements are characterized by learned anticipatory responses that are based on estimated future demands and experience from past events (Ramsay & Woods, 2014).

The allostatic process includes estimations of the current state of the organism, the current state of the environment, a prediction of how the states might change over time, and a prediction of the magnitude of response necessary to effectively regulate the system (Stephan et al., 2016). Allostasis also accounts for the ongoing evaluation of resources and demands (Ganzel et al., 2010). These elements appear to integrate well with the appraisal model of the stress response. The appraisal process includes estimations of outcomes, review of previous coping strategies, assessment of resources and demands, and evaluation of various factors related to the current state of the organism and the circumstance (Lovallo, 2015; Ganzel et al., 2010; Scherer & Moors, 2019; Smith & Kirby, 2011). The prediction aspect of the allostatic process appears to fill in an apparent conceptual gap between appraisal and response, accounting for how the response magnitude is decided upon.

The allostatic prediction of the necessary magnitude of response appears vital to the response phase, as the level of arousal and adaptation would greatly influence the rest of the allostatic process. While anticipatory responses have several advantages, they also come with several risks, including the under or overestimation of a threat, activation of a stress response in the absence of a real threat, and potentially prolonged activation of the stress response (Tonhajzerova & Mestanik, 2017). One of the most significant risks associated with allostatic regulation appears to be under or over corrective responses (Ramsay & Woods, 2014). In the case of undercorrections, if the magnitude of response is too low, there may be an inhibition of

social learning, reduced sensitivity to social feedback, and increased risk-taking and impulsivity as the individual would be less able to acquire information about threats in the environment (Del Giudice, Hinnant, Ellis, & El-Sheikh, 2012). Conversely, if the magnitude of response is too high, as seen in acute trauma responses, or too prolonged, as seen in chronic stress responses, the individual becomes at risk for significant dysregulation (Arnsten et al., 2015; Cranston, 2014; Ganzel et al., 2010).

The dynamic process of responding to a stressor by establishing new homeostatic states has been referred to as *allostatic accommodation* (Ganzel et al., 2010). The core emotional regions of the brain, including the amygdala, ACC, PFC, and hippocampus, are considered the primary sites for allostatic accommodation due to their role in processing and initiating regulatory responses (Ganzel et al., 2011). The adaptation that occurs within these emotional regions is referred to as *central allostatic accommodation* (Ganzel et al., 2010). Central allostatic accommodation gives rise to *peripheral allostatic accommodation*, which is the secondary set of stress responses including activation of the SAM and HPA axes, stress hormone production, inhibition of the reproductive system, and changes to gastrointestinal function (Ganzel et al., 2011). The peripheral accommodation also includes metabolic, immune, cardiovascular, neuroendocrine, and inflammatory responses (Edes & Crews, 2016).

Allostatic accommodation contributes to overall allostatic load, but the effectiveness of adaptation determines whether the process is successfully resolved (Karatsoreos & McEwen, 2011). Ganzel and associates (2010) present an inverted U-shaped curve that represents the relationship between stress and health outcomes – similar to the Yerkes-Dodson inverted U-shaped curve of stress (Yerkes & Dodson, 1908) – with the far left representing an absence of healthy adaptation that results in negative consequences and the far right representing conditions

of extreme and/or chronic stress that wear down the health of the system. If adaptation is not successful, allostatic load can become *allostatic overload*, whereby the wear and tear of adaptation results in deleterious effects (McEwen, 2005). In this case, the adaptive response is inappropriate, inadequate, excessive, or prolonged, which is referred to as *cacostasis* (Chrousos, 2009).

In reviewing the stress response, the process may seem rather bleak, as outcomes have been primarily presented as being either negative or, at best, neutral. The concept of allostasis goes beyond merely attempting to avoid harmful results. Allostasis captures the more encouraging aspects of adaptation. The inverted U-shaped curve presented by Ganzel and associates (2010) includes a middle section, which represents an adequate adaptation to stress. If adaptation is successful – somewhere near the middle of the curve – the organism will exhibit a health elasticity in their response and accumulation of allostatic load will likely be negligible (Ganzel et al., 2010). In this case, the adaptive response is ideal (Chrousos, 2009) and the organism demonstrates *resilience* – the ability to rebound from adversity (Karatsoreos & McEwen, 2011) or achieve a positive outcome in the face of adversity (McEwen, Gray, & Nasca, 2014). This ideal match of response to demand is referred to as *eustasis* (Chrousos, 2009). Even if the organism initially experiences some negative allostatic shift, it can demonstrate recovery – the internally driven return to baseline functioning (Karatsoreos & McEwen, 2011).

There appear to be some instances in the concept of allostasis where an organism can experience an increase in coping capacity or a decrease in the effects of stressors. According to Chrousos (2009), if an adaptive response is a perfect match to the stressor, the organism may gain from the experience, achieving an improved homeostatic capacity. Improved homeostatic capacity may include more efficient physiological responses to stress, more rapid recovery from

stress, as well as health-enhancing changes to baseline physiological processes such as heart rate variability and anabolic hormone level (Sheldon, Kashdan, & Steger, 2011). This favorable enhancement to adaptability is referred to as *hyperstasis* (Chrousos, 2009). It is also possible for an organism to habituate to a stressor, whereby adaptation leads to reduced subsequent reactions (Herman, 2013). This habituation, which has been compared to the immune response of fighting infection before it becomes an illness, is referred to as *resistance* (Karatsoreos & McEwen, 2011). It has been proposed that these improved responses may be a result of positive appraisals, increased perceptions of resources, and improved coping strategies (Sheldon et al., 2011).

Through an examination of neurophysiology research, the chronic stress response elucidates several significant elements that could provide further insights into the conceptualization of burnout. The apparent progression of the stress response, which can be an automatic or conscious process, consists of the perception of a potential stressor, appraisals of the potential stressor, and then responses to the stressor if it is appraised as such. Responses appear to include numerous neurophysiological adaptations, with significant involvement from the stress hormone cortisol and brain regions such as the amygdala, hippocampus, and PFC. Over time, it appears that longer-term adaptation to chronic stress, allostasis, can take a toll on the neurophysiological system and lead to various dysfunction. With a better understanding of the underpinnings of the chronic stress process, a foundation is laid for integrating the neurophysiology of the stress process with conceptual elements of the burnout construct.

CHAPTER V: INTEGRATING STRESS AND BURNOUT LITERATURE

At this point, the critical question is whether the conceptual elements of burnout literature can be integrated with the neurophysiological aspects of stress literature cohesively and comprehensively. The primary goal of this chapter is to examine whether the stress process can explain the origin, progression, and presentation of burnout. Secondary goals of this section are to examine whether the stress process can help to distinguish burnout from other conditions and whether the stress process can provide clarity regarding inconsistencies in the burnout literature. Finally, this section will conclude with a proposed definition and model of burnout based on a synthesis of the reviewed literature.

Explaining Burnout

Origin. The previously reviewed neurophysiology of the stress process appears to provide a framework for how burnout begins. The stress literature indicates that the stress process essentially follows a pattern of stressor, sensory processing of event, primary and secondary appraisals of the stressor and coping resources, then physiological threat response (Lazarus & Folkman, 1984; Lovallo, 2015). Following the physiological response, the stress response attempts to regulate itself through negative feedback channels (Cranston, 2014; Lovallo, 2015). If the stress response remains active, stress hormones such as cortisol remain elevated, which has deleterious effects on the entire physiological system (Carlson & Birkett, 2016; Juster et al., 2010). Of note, the appraisal process can be split into a low-road that occurs automatically, and a high-road that is more of a top-down evaluative process (Lewis et al., 2016). This suggests that the appraisal process is iterative, in that top-down high-road appraisals (e.g., intentionally thinking about the outcome of a stressful situation) can influence future automatic low-road stress responses (Ganzel et al., 2010). Taken together, a more comprehensive look at

the stress response reveals a pattern of stressor, sensory processing of event, low-road appraisal of stressor and coping resources, high-road processing of stressor and coping resources, physiological threat response, attempt at physiological regulation, reappraisal of stressor and coping resources, and iterative influence on future appraisal of stressors. In this model, burnout appears to begin at the point where the stress response is chronically activated and begins to have deleterious effects on the system.

When comparing the neurophysiology of the stress response to the burnout literature, it becomes clear that the commonalities in the conceptualizations of burnout overlap with the neurophysiological progression of chronic stress, specifically the process of allostasis. As reviewed previously, the prevalent models of burnout include some mention of a stress process and some framework of resources and demands. The stress response accounts for the resources and demands framework through the appraisal process. If burnout is commonly seen as a chronic stress-related condition in which the individual is worn down, the deleterious effects of a chronically engaged stress response (i.e., allostasis) and the iterative nature of the appraisal process would certainly encapsulate that.

Regardless of whether burnout is conceptualized as a process or a condition, allostasis appears to account for its origin. If burnout is seen as a process, allostatic overload – the deleterious wear and tear that occurs over time from chronic stress adaptation (McEwen and Stellar, 1993) – could almost be used interchangeably with burnout. If burnout is seen as a condition, then allostasis would describe the process and burnout would represent the allostatic tipping point, the stage at which allostatic accommodation has shifted beyond being helpful and adaptive to being harmful to the individual's ability to effectively function. In this model, burnout would essentially represent the far right of the inverted U-shaped stress curve – the

conditions of extreme and chronic stress that wear down the system – that Ganzel and associates (2010) used to represent stress and health outcomes.

Furthermore, it stands to reason that the iterative nature of the appraisal process might push the inverted U-shaped curve further to the far right if outcomes and coping strategies are unsuccessful. If secondary appraisals of coping abilities are negative, the individual is likely to experience a shift in the balance of perceived resources and demands, wherein perception of coping ability – a resource – is depleted and perception of stressors – demands – becomes more daunting. Subsequently, the individual's appraisal of the next stressor is likely to be more negative, both through low-road and high-road responses, further contributing to elevated levels of stress and decreased abilities to regulate the stress response, further wearing down the system. This downward spiral of sorts appears to capture the nature of burnout, both as a process and a condition.

Progression. It stands to reason that the iterative nature of the appraisal process might push the inverted U-shaped curve further to the far right if outcomes and/or coping strategies are unsuccessful, thus accounting for the general progression of burnout in which the individual gradually exhausts available resources, becomes fatigued, and eventually loses the ability to effectively cope. If secondary appraisals of coping abilities are negative, the individual is likely to experience a shift in the balance of perceived resources and demands, wherein perception of coping ability – a resource – is depleted and perception of stressors – demands – becomes more daunting. Subsequently, the individual's primary and secondary appraisals of the next stressor are likely to be more negative, both through low-road and high-road responses, further contributing to elevated levels of stress and decreased abilities to regulate the stress response, further wearing down the system. The neurophysiology of chronic stress provides further

evidence, as the amygdala experiences increased activation and volume over time, and the frontal cortex experiences decreased activation and volume over time (Arnsten et al., 2015; Dedovic et al., 2009; McEwen, 2008; McEwen et al., 2016; Moreno, Bruss, & Denburg, 2017; Sauro et al., 2003; Savic, 2015), which would further increase stress reactivity and further reduce regulatory functions. This downward spiral of sorts appears to capture the nature of burnout, both as a process and a condition.

The process of becoming exhausted that is central to most definitions of burnout is easily explained by the neurophysiology of the chronic stress response. Cortisol plays an integral part in the regulation of energy throughout the day (Dahlgren, Kecklund, Theorell, & Akerstedt, 2009), with high levels at awakening, a gradual decrease throughout the day, and a low point at night (Marchand, Juster, Durand & Lupien, 2014). These changes in cortisol throughout the day are related to circadian rhythm and referred to as diurnal cortisol slopes (Adam et al., 2017). Chronic stress appears to create dysfunction in diurnal cortisol slopes, including lower levels during awakening and higher levels before sleep, leading to decreases in sleep duration, quality, and efficiency, as well as increases in fatigue (Adam et al., 2017; Engert et al., 2018; Hirotsu, Tufik, & Andersen, 2015; Massar, Liu, Mohammad, & Chee, 2017; van Dalfsen & Markus, 2018). Sleep difficulties associated with chronic stress include poor restoration during sleep, increased fragmentation of sleep, less time in bed spent asleep, and reduced slow wave activity, all of which can increase fatigue and sleepiness (Dahlgren et al., 2009; Ekstedt, Soderstrom, & Akerstedt, 2009; Sonnenschein, Sorbi, van Doornen, Schaufeli, & Maas, 2007). Moreover, there is a bidirectional relationship between stress and sleep, with higher levels of stress negatively impacting sleep and poor sleep increasing stress reactivity (van Dalfsen & Markus, 2018). This appears to create a negative cascade in which stress impairs sleep, which then creates more

stress, further impairing sleep. The changes in diurnal cortisol slopes and subsequent sleep disturbances appear to provide an explanation for the exhaustion and fatigue generally associated with burnout. Burnout research also appears to support this notion, as burnout has been associated with both dysregulated diurnal cortisol (Grossi et al., 2005; Marchand, Juster, Durand, & Lupien, 2014; Oosterholt, Maes, Van der Linden, Verbraak, & Kompier, 2015; Penz et al., 2018) and sleep disturbances (Ekstedt, Soderstrom, Akerstedt, 2009; Vela-Bueno et al., 2008; Wolf, 2016).

Presentation. While exhaustion is one of the most common symptoms associated with burnout, the neurophysiology of the chronic stress response appears to explain all the intrapersonal, interpersonal, and extrapersonal symptoms associated with the condition.

Intrapersonal symptoms. The intrapersonal domain consists of physical, mental, and behavioral symptoms and includes the previously explored exhaustion, increased health concerns, psychological distress, and decreased job performance. Increased health concerns are easily explained through the neurophysiology of the chronic stress response. The chronic stress response leads to prolonged elevation of blood pressure, which can lead to cardiovascular damage (McEwen, 2010). Chronically elevated levels of cortisol suppress specific immune responses, leading to an inhibition of the inflammatory response, and increasing an individual's risk for illness (McEwen, 2010; McEwen & Wingfield, 2003; Romero et al., 2009). While short-term elevation in heart rate, heart rate variability, and blood pressure are beneficial for managing threats, long-term elevation in these areas leads to hypertension, lethargy, metabolic syndrome, and potentially myocardial infarction (Romero et al., 2009). Considering the increased risk for illness, the significant correlation between burnout and work absence (Borritz et al., 2006; Ahola et al., 2008) becomes easily understood. Neurologically, dysregulation of the ACC associated

with chronic stress appears to account for symptoms of muscles aches and soreness, as the ACC is involved in processing information related to pain (Sellmeijer et al., 2018). Additionally, dysfunction in the ACC, PFC, and basal ganglia have been implicated in motor impairments (Bennabi, Vandel, Papaxanthis, Pozzo, & Haffen, 2013)., which could help to explain symptoms such as disorientation, proneness to accidents, and psychomotor retardation that have been linked to burnout (Figley, 1995; Pfeffer, Paletta, & Suchar, 2018). Finally, it is interesting to note that elevated cortisol contributes to an increase in appetite and increased deposition of body fat (McEwen, 2000), as well as an increased preference and desire for foods high in calories (Tryon, Carter, DeCant, & Laugero, 2013), sugars, fats, and carbohydrates (Adam & Epel, 2007; Korte et al., 2005), which helps to put the correlation between burnout and obesity (Ahola et al., 2012) into context.

Regarding psychological distress, several common burnout symptoms can be accounted for by neurophysiological changes that occur during a continuous stress process. Increased irritability and frustration can be explained partially by dysregulation of the ACC, which plays a central role in the "integration of affective, sensory, and cognitive processes to determine an appropriate yet flexible response" (Besteher et al., 2017, p. 6). Hyperactivity in the amygdala, reduced prefrontal activity, and reduced functional connectivity between the amygdala and the PFC, which are all associated with chronic stress, have also been implicated in the increased expression of irritability (Leibenluft & Stoddard, 2013). More specifically, it appears that frustration is related to brain regions that mediate emotional response and learning, attentional shifting, and response conflict resolution, including the amygdala, vmPFC, ventrolateral PFC, and ACC (Leibenluft & Stoddard, 2013, p. 11). In general, dysfunction of the PFC has been associated with decreased impulse control, increased reckless behavior, impaired modulation of

emotional reactions, increased irritability, decreased insight, and impaired decision-making (see review in Arnsten et al., 2015). Increased experience and expression of irritability under chronic stress makes sense considering the amygdala would be more active, increasing threat detection, and the prefrontal areas would be less reactive, decreasing the ability to regulate emotions, shift attention, and inhibit impulses.

Sadness, or depressed mood, is another common symptom of burnout (Farber, 1991; Figley, 1995). Hypoactivation of the PFC and hyperactivation of the amygdala, as seen in a chronic stress response, has been implicated in sadness/depressed mood (Furman, Hamilton, Joorman, & Gotlib, 2011; Lanteaume et al., 2007; Murray, Wise, & Drevets, 2011; Zhong et al., 2011). The ACC also appears to be implicated in sadness, specifically related to functional connectivity with the amygdala, suggesting that the ACC is not only involved in physical pain perception but also the perception of emotional pain (Yoshino et al., 2010). Elevated levels of cortisol have been directly linked to increased arousal to sadness-evoking stimuli as well as dysfunction in ACC and PFC activation during experiences of sadness (Sudheimer et al., 2013). Interestingly, it appears that these neurological changes lend support to the idea that chronic stress creates a negative cascade.

Research indicates that individuals who experience dysfunction in amygdala, ACC, and PFC activity become less likely to engage in top-down appraisal strategies to regulate negative emotions such as sadness (Levesque et al., 2003; Watters et al., 2018), which ultimately contributes to increased amygdala reactivity and decreased activation of the PFC (Belden, Luby, Pagliaccio, & Barch, 2014). Furthermore, increased activation of the amygdala and dysfunction in the ACC are critical contributors to the development of a negativity bias in which neutral stimuli are interpreted as negative and negative events are more easily remembered (Admon et

al., 2018; De Raedt & Koster, 2010; Ito et al, 2017; Peckham, McHugh, & Otto, 2010). The development of a negativity bias is significant because it creates a situation in which individuals under chronic stress are not only less able to utilize effective emotional regulation strategies, but they become more likely to interpret non-threatening stimuli/events as threatening, increasing quantity and frequency of stressors and, subsequently, the perception of demands. Individuals are also more likely to recall adverse outcomes, further decreasing the perception of resources, further lowering mood, increasing amygdala activity, and decreasing PFC activity. This cascade strengthens automatic, low-road processing of emotional stimuli (Buodo, Mento, Sarlo, & Palomba, 2014) and has been associated with the development of another symptom associated with burnout – hopelessness (see review in Auerbach, Webb, Gardiner, & Pechtel, 2013; Ito et al., 2017).

Another often-referenced symptom of burnout is lowered self-esteem. Research indicates that dysfunctions in brain regions implicated in the chronic stress response, such as the dorsal anterior cingulate cortex, anterior insula, and medial PFC, also contribute to the development of low self-esteem (Kawamichi et al., 2018). Low self-esteem has also been correlated to lower levels of perceived control, higher cortisol levels, and lowered hippocampal volume (Pruessner et al., 2005; Scarpa & Luscher, 2002). Adverse changes in self-esteem seem reasonable considering that self-esteem involves a self-appraisal of one's ability and chronic stress seems to diminish one's appraisal abilities, increase focus on negativity, and increase negative self-evaluation (Ford & Collins, 2010; Pan et al., 2016; van Schie, Chiu, Rombouts, Heiser, & Elzinga, 2018; Wu et al., 2015). Shame and guilt, two symptoms implicated in burnout and chronic stress, are also associated with changes to the activation of the PFC, amygdala, and ACC, (Bastin, Harrison, Davey, Moll, & Whittle, 2016). This is important because the

experience of guilt and shame has been associated with decreases in self-worth – along with increases in cortisol activity – leading to lowered self-esteem (Gruenewald, Kemeny, Aziz, & Fahey, 2004; Velotti, Garofalo, Bottazzi, & Carretti, 2016).

One of the fundamental characteristics of burnout presentation appears to be the perception of decreased work efficacy. There appear to be three stress-related issues that contribute to this perception. The first issue, that was mentioned previously, is that the neurophysiological changes that occur in the brain during a chronic stress process promote increased attention to and recall of negative stimuli, events, or outcomes (Admon et al., 2018; De Raedt & Koster, 2010; Ito et al., 2017; Peckham, McHugh, & Otto, 2010). This negativity bias is likely to distort an individual's perception of efficacy because they are less able to notice positive outcomes and more likely to focus on adverse outcomes.

The second contributing factor is that individuals may experience changes in their perception of control. Specifically, individuals who experience chronic stress may develop higher levels of external locus of control – believing that outcomes are a function of luck rather than personal behaviors (Tak, Brunwasser, Lichtwarck-Aschoff, & Engels, 2017). High levels of external locus of control can increase perceptions of helplessness (Filippello, Sorrenti, Buzzai, & Costa, 2015; Shnek et al., 1997) and decrease perceptions of self-efficacy (Roddenberry & Renk, 2010). Activity in prefrontal areas of the brain, including the medial PFC, has been found to have a positive relationship with perceptions of control and a negative relationship with stress levels (Leotti, Iyengar, & Ochsner, 2010).

The third issue contributing to perceptions of decreased work efficacy is that chronic stress creates neurological conditions that promote cognitive deficits, meaning that, individuals perceive that they are less effective in their work because, to some degree, they are. Burnout and

elevated cortisol levels have been associated with decreased executive functioning (Beck, Gerber, Brand, Puhse, & Holsboer-Trachsler, 2013) and performance (Flynn & James, 2009; Oosterholt, Maes, Van der Linden, Verbraak, & Kompier, 2016). More specifically, chronic stress and the subsequent neurophysiological adaptations that occur result in a decrease in the ability to concentrate (Arnsten et al, 2015; Barsegyan, Mackenzie, Kurose, McGaugh, & Roozendaal, 2010), difficulties with attentional-shifting (Liston, McEwen, & Casey, 2009; Schaefer et al., 2013; Sokka et al., 2016), deficits in working memory (Barsegyan et al, 2010; Sokka et al., 2016), increased ruminations (Cooney, Joormann, Eugene, Dennis, & Gotlib, 2010; Dedovic et al., 2009; Zoccola, Dickerson, & Zaldivar, 2008), increased distractibility (Jain et al., 2007) and impairments in error processing (Olvet & Hajcak, 2008; Sokka et al., 2017, Weinberg et al., 2016; Weston, 2012). These changes to cognitive processes appear to contribute to decreased work performance, which would understandably have a negative influence on perceptions of work efficacy.

Interpersonal symptoms. There are several interpersonal symptoms associated with burnout that can be explained by the neurophysiological chronic stress process. Among the interpersonal symptoms, the most prevalent appear to be irritability, increased relational conflict, cynicism/depersonalization, and withdrawal or social isolation. Irritability, which has already been discussed, appears to be related to dysregulation in the ACC (Besteher et al., 2017), as well as hyperactivity in the amygdala and reduced activity in the PFC (Leibenluft & Stoddard, 2013; Arnsten et al., 2015). Considering the increased irritability associated with the chronic stress process (Wallensten et al., 2016) and the general deficits in impulse control, modulation of emotional reactions, and decision-making associated with dysfunction in the PFC (Arnsten et al.,

2015), increased relational conflict might be expected for individuals experiencing the level of chronic distress that is associated with burnout.

Cynicism, also referred to as depersonalization, is related to stress level, with higher levels of stress correlating to more cynical attitudes (Viljoen & Claassen, 2017) and dysregulated cortisol diurnal patterns being associated with increased cynicism (Pope & Smith, 1991; Ranjit et al., 2009). Research findings indicate that chronic stress and cynicism are both associated with blunted responses on domains of EEG readings that are related to motivational relevance and engagement (Golonka, Mojsa-Kaja, Popiel, Marek, & Gawlowska, 2017). Neurologically, higher levels of cynicism have been associated with decreases in prefrontal functioning that are typical of chronic stress (Papousek et al., 2017). While there is some debate as to whether cynicism is an active coping strategy in response to emotional exhaustion (Bakker et al., 2000; De Lange et al., 2004; Taris et al., 2005), it does appear that there is a relationship between increased detachment and decreased stress in the context of burnout research (Lampert & Glaser, 2016; McManus, Winder, & Gordon, 2002). Interestingly, it appears that cynicism mitigates negative affect in response to relationship conflict (Li, Zhou, & Leung, 2011).

It has been suggested that cynicism is negatively related to empathy (Bowhay, 2013) and research has found that brain regions associated with empathy show decreased activation in individuals experiencing chronic stress (Tei et al., 2014) and increased association with cynicism (Golonka et al., 2017). Research has indicated that there is a negative relationship between empathy and burnout (Brazeau, Schroeder, Rovi, & Boyd, 2010). Empathy is associated with the theory of mind, the ability to infer the mental states of others, and is related to activation in the medial PFC and ventromedial PFC, ACC, and amygdala – areas that are typically dysregulated during a continuous stress process (Dvash & Shamay-Tsoory, 2014). These

findings would suggest that individuals suffering from burnout would not only experience a decreased desire to understand another's perspective, but also a decreased ability.

With an increase in irritability, relational conflicts, and cynicism, it is not surprising that individuals experiencing burnout tend to withdraw socially and isolate (Farber, 1991; Figley, 1995). Neurologically, decreased activation of left prefrontal brain regions associated with chronic stress increases avoidance motivation (Zotev et al., 2016), while increased levels of cortisol influence right prefrontal brain regions and inhibit approach motivation (Tops et al., 2005). If chronic stress is related to an increase in avoidance-related brain activity and a decrease in approach-related brain activity, it makes sense that chronic stress would make it more difficult for individuals to utilize their social supports and easier to isolate.

Moreover, elevated cortisol appears to have an inhibitory effect on perceived social support and help-seeking behaviors, particularly related to friends and family (Chin, Chan, Lam, Lam, & Wan, 2015; Thomas & Larkin, 2018). Help-seeking may be difficult in a work context, as expressions of distress at work are associated with incompetence, lack of control, and weakness (see review in Wolf, Lee, Sah, & Brooks, 2016). In the context of stressful interpersonal situations, it appears that seeking social support may increase physiological distress (Gunlicks-Stoessel & Powers, 2009). Stressful environments may also negatively influence the quality of social support that an individual can provide (Bodenmann, Meuwly, & Germann, 2015). This finding may have specific work-related implications, as stressed individuals might be less effective in providing support to colleagues, but they might also receive less effective support from colleagues if those colleagues are also experiencing higher levels of stress. In both cases, it would stand to reason that work relationships might be negatively influenced. Taken

together, it appears that chronic stress promotes interpersonal avoidance, lowers perceptions of social support, and decreases utilization of social support.

Extrapersonal symptoms. The neurophysiology of chronic stress appears to account for burnout-related changes that occur in an individual's relationship with their specific job and their line of work, as well as changes that can occur to an individual's perceptions of the world. Chronic stress has been implicated in the development of dysfunction in the medial PFC (McEwen, Nasca, & Gray, 2016), an area of the brain associated with the sense of connectedness (Hutcherson, Seppala, & Gross, 2015). A sense of connectedness appears to be related to organizational commitment (Huynh, Winefield, Xanthopoulou, & Metzer, 2012; Rego & Pina e Cunha, 2008). These findings would suggest that chronic stress is likely to hurt one's sense of connectedness and commitment to their specific workplace and organization. Other factors that are likely to negatively impact an individual's relationship to their job include decreased performance (Flynn & James, 2009; Oosterholt, Maes, Van der Linden, Verbraak, & Kompier, 2016), decreased perception of support (Chin, Chan, Lam, Lam, & Wan, 2015; Thomas & Larkin, 2018), decreased engagement (Golonka, Mojsa-Kaja, Popiel, Marek, & Gawlowska, 2017), increased cynicism (Pope & Smith, 1991; Ranjit et al., 2009; Viljoen & Claassen, 2017), and a decreased sense of efficacy (Leotti et al., 2010; Roddenberry & Renk, 2010).

The chronic stress process appears to account for several negative changes to an individual's perceptions. Dysfunction in prefrontal brain regions typical of a chronic stress process has been associated with increased levels of pessimism (Herwig et al., 2010). These dysfunctions, along with increases in cynicism (Pope & Smith, 1991; Ranjit et al., 2009; Viljoen & Claassen, 2017), and the development of a negativity bias (Admon et al., 2018; De Raedt & Koster, 2010; Ito et al, 2017; Peckham, McHugh, & Otto, 2010) would likely contribute to

alterations in how an individual perceives work and the world. Specifically related to the work context, burnout has been associated with a loss of meaning-making, identity, and sense of integrity (McCormack, Abou-Hamdan, & Joseph, 2017). Neural mechanisms involved include dysregulations in the orbitofrontal cortex and amygdala (Nicolle, Bach, Frith, & Dolan, 2011), which have also been associated with the development of career regret, self-blame, and reconsideration of career path (Dyrbye, Burke, & Hardeman, 2018; Lemkau, Rafferty, & Gordon, 1994; McCormack et al., 2017, Nicolle, Bach, Frith, & Dolan, 2011).

Unsurprisingly, the neurophysiological dysfunctions associated with chronic stress appear to be influential in alterations to more existential perspectives. Dysfunctions in stress-sensitive brain regions such as the amygdala, hippocampus, and insula are related to a decrease in one's sense of well-being and purpose in life (Lewis et al., 2014). A lower sense of purpose or meaning in one's life has been associated with higher levels of cortisol, increased amygdala reactivity, dysregulation of the ventral ACC, decreased amygdala regulation, and decreases in gray matter volume (Schaefer et al., 2013). Existential fulfillment, a construct related to life-meaning, fulfillment, and perceptions of self-actualization, self-acceptance, and self-transcendence (Loonstra, Brouwers, & Tomic, 2009), has been negatively associated with the chronic stress process (Tomic, Evers, & Brouwers, 2004; Tomic & Tomic, 2008). Research has suggested that burnout can decrease one's sense of existential fulfillment (Lemkau et al., 1994; Loonstra et al., 2009). Furthermore, research indicates that chronic stress may negatively affect attitudes and world views, including beliefs that the world is a safe place and religious beliefs (Lilly, Valdez, & Graham-Bermann, 2010; Nygaard & Heir, 2012; Pedrelli, Feldman, Vorono, Fava, & Petersen, 2008; ter Kuile & Ehring, 2014).

Behaviorally, the chronic stress process appears to influence the individual's ability to act in the world. Chronically elevated stress decreases the activity in approach-oriented left prefrontal brain regions (Zotev et al., 2016), partially explaining decreased behaviors. Elevated cortisol has been found to inhibit goal-directed behaviors (Tops & Boksem, 2011) and increase habitual behaviors (Hollon, Burgeno, & Phillips, 2015). Chronic-stress-related dysfunctions in regions of the PFC and amygdala have been associated with a decrease in motivation and anhedonia – the reduction in pleasure from activities (Hollon et al., 2015; Keedwell et al., 2005). These findings suggest that individuals experiencing chronic stress are not only less able to engage in activities, but they likely derive less pleasure from activities that they can engage in.

Distinguishing Burnout from Other Conditions

The progression and symptomology associated with burnout appear to be easily explained by the neurophysiology of a chronic stress process. There remains, however, the issue of whether burnout can be distinguished from other conditions and, if so, how. Having reviewed the relevant burnout and stress literature, the next important step is to apply the findings in order to help differentiate burnout from depression and other work-related concepts such as compassion fatigue, secondary trauma, and vicarious traumatization.

Depression. Considering that research indicates that depression is a stress-related process (Andrews & Thomson, 2009; Bianchi et al., 2015b; Orosz et al., 2017; Schonfeld, & Laurent, 2014; Lovallo, 2015), it would make sense that there is a considerable amount of overlap between depression and burnout (Bianchi et al., 2013; Kaschka et al., 2011). The relationship between burnout and depression has created some conflict, with some researchers taking the stance that burnout is a distinctly different condition (Brenninkmeyer et al., 2001; Maslach, 2016; Suls & Bunde, 2005; Thuynsma & de Beer, 2017) and others taking the stance

that burnout is a type of depression (Bianchi et al., 2013; Bianchi et al., 2014; Schonfeld & Bianchi, 2016; Wurm et al., 2016). There have been numerous studies that have attempted to identify specific variables that might help to differentiate burnout from depression.

Brenninkmeyer et al. (2001) theorized that depression is associated with a general sense of defeat in which the individual loses their natural sense of superiority. The authors posit that sense of superiority is an evolutionary commonality for non-depressed individuals and that it is related to contention for status and social rank. In their research, they found that there was a relationship between depression and a lower sense of superiority, but no relationship between burnout and a lower sense of superiority. Melchers and associates (2015) found that depression was related more to personality factors such as harm avoidance and self-directedness, whereas burnout was not. Aliyeva (2018) found that depression predicted neuroticism and low levels of agreeableness, whereas burnout appeared to be unrelated to personality. These studies appear to provide support for depression being a more static condition, influenced by personality variables and individual characteristics, whereas burnout is more likely related to environmental contexts. Studies involving EEG comparisons between individuals with burnout and individuals with depression found differences in variables such as alpha frequency and alpha power, with depression being associated with EEG variables that are thought to be related to brain structure and connectivity and burnout being associated with variables thought to be related to cognitive activity level and development of fatigue (Tement, Pahor, & Jausovec, 2016; van Luijtelaar, Verbraak, van den Bunt, Keijsers, & Arns, 2010). These findings appear to support the notion that depression is a more fixed condition compared to burnout.

Research regarding allostatic load biomarkers has been inconsistent, with some research finding that biomarkers are correlated to levels of burnout and depression (Hintsa et al., 2016) and some research finding that biomarkers are only associated with chronic stress and burnout, not depression (Juster et al., 2011). Cortisol research has been conflicting, with some research indicating that burnout is related to excessive cortisol, or hypercortisolism (Juster et al., 2011; Miller, Chen, & Zhou, 2007; Penz et al., 2018), and other research indicating that burnout is related to deficits in cortisol, or hypocortisolism (Duan et al., 2013; Lennartsson, Sjors, Wahrborg, Ljung, & Jonsdottir, 2015; Tops et al., 2007). These findings begin to make more sense when considering research suggests that cortisol has a nonlinear relationship with burnout, with basal levels being unaffected until a certain point, an increase in cortisol levels, then minimal additional changes in cortisol levels occurring at more severe presentation, and potentially a reduction in cortisol at some point (Penz et al., 2018). Research suggests that alterations to the HPA system can occur over long-term chronic stress exposure, with changes in cortisol diurnal patterns and general cortisol responses (Duan et al., 2013; Hartwig, Aust, & Heuser, 2013; Marchand et al., 2014). More specifically, it is suggested that cortisol elevates initially to a point of hypercortisolism and then reduces over time, resulting in hypocortisolism (Duan et al, 2013; Fries, Hesse, Hellhammer, & Hellhammer, 2005; Heim, Ehlert, & Hellhammer, 2000; Maripuu, Wikgren, Karling, Adolfsson, & Norrback, 2017; Miller et al., 2007). Burnout research appears to support that trajectory as some research has found that hypocortisolism is only found in individuals with more severe burnout symptoms (Lennartsson et al., 2015), while neuroendocrine research indicates that cortisol levels increase as burnout increases then decrease as burnout and depression become high (Huffman, 2017). It may be that research is capturing individuals at different points in the same allostatic process, which might

explain why some literature finds differences in specific biomarkers. Another possible explanation for inconsistencies in differentiating burnout from depression might be that research has not accounted for differing presentations of depression. Melancholic depression and atypical depression have been found to differ in how cortisol levels are affected (Gold & Chrousos, 2002; Kunugi, Hori, & Ogawa, 2015; Tops et al., 2007) and research suggests that burnout is more similar to atypical depression than melancholic depression (Bianchi et al., 2014).

The most apparent difference between burnout and depression may lie in how burnout is conceptualized. If burnout is used to describe a condition of symptoms, it is likely to resemble depression since they appear to share similar, if not identical, neurophysiological dysfunction (Kanthak et al., 2016). If burnout is used to describe a process, it may not look the same as depression, because the individual may not have passed the allostatic tipping point at which they would demonstrate depressive symptoms. The research seems to suggest that burnout is the process and depression is the outcome, which is supported by research that indicates that burnout becomes qualitatively more similar to depression the more severe it becomes (Iacovides, Fountoulakis, & Kaprinis, 2003). When considering the iterative and recursive nature of the stress process, it would seem that a burnout process would consist of (a) individuals experiencing instances of distress, (b) those instances of distress reaching a frequency, duration, and/or intensity that causes neurophysiological allostatic adaptations, (c) those adaptations reaching a point that they become lasting, (d) the development of depressive symptoms as a result of those adaptations, and finally (e) significant enough symptoms that would meet criteria for a diagnosis of depression. The problem with using burnout to represent a condition is that research would likely only capture individuals that fall between (d) and (e), which neglects more than half of the burnout process and may contribute to some of the inconsistencies in the literature.

Compassion fatigue. The use of the term compassion fatigue creates further confusion in burnout research. Compassion fatigue was initially used to describe burnout and secondary trauma (Figley, 1995) and has been used interchangeably with burnout, secondary traumatic stress, and vicarious trauma (Craig & Sprang, 2010; van Mol et al., 2015). Recent research appears to distinguish burnout from compassion fatigue through context, with burnout occurring as a result of work-related stressors such as workload, bureaucracy, and lack of perceived organizational support (Hopwood, Schutte, & Loi, 2018; Newell, Nelson-Gardell, & MacNeil, 2016), and compassion fatigue occurring as a result of helping professionals repeatedly engaging empathically with distressed individuals and being exposed to client/patient trauma (Baugerud, Vangbaek, & Melinder, 2018; Frey, Robinson, Wong, & Gott, 2018; Lee, Veach, MacFarlane, & LeRoy, 2014). One other distinguishing feature appears to be onset, with burnout being seen as a gradual process and compassion fatigue having a potentially sudden onset (Hunsaker, Chen, Maughan, & Heaston, 2015, Lee et al., 2014). Compassion fatigue research seems to agree that compassion fatigue is comprised of burnout and secondary traumatic stress (Allsbrook et al., 2016; Frey et al., 2018; Hopwood et al., 2018; van Mol et al., 2015). While compassion fatigue researchers appear to put a focus on the loss of empathy associated with compassion fatigue, the neurophysiological alterations associated with the stress response account for diminished capacity for empathy (Brazeau et al., 2010; Dvash & Shamay-Tsoory, 2014; Tei et al., 2014), meaning that empathy has the potential to be negatively impacted for either construct. Of note, a recent meta-analysis indicated that use of empathy is not central to compassion fatigue, rather a lack of resources and personal distress responses – characterized by negative stress appraisals – are central to the development of the condition (Coetzee & Laschinger, 2017).

The difficulty in clarifying the differences between burnout and compassion fatigue is that compassion fatigue also appears to refer to both a process and a condition. The process aspect of compassion fatigue, in which helping professionals are exposed to the distress of others and gradually lose their ability to empathize, corresponds to the wearing down process that occurs in burnout, despite differing contexts. The condition aspect of compassion fatigue appears to refer to trauma-related symptoms, which are also referred to using the terms secondary trauma and vicarious trauma.

Secondary trauma and vicarious trauma. The literature that does not use secondary trauma and vicarious trauma interchangeably suggests that the two terms are slightly different in their context (Jenkins & Baird, 2002). It has been suggested that secondary trauma refers to symptoms that are typically associated with posttraumatic stress disorder (PTSD), including intrusion, avoidance, and arousal, while vicarious trauma refers to the negative cognitive changes that can occur as a result of trauma, including a change in identity, world view, beliefs, sense of safety, and sense of control (Baird & Kracen, 2006; Devilly et al., 2009; Jenkins & Baird, 2002; McCann & Pearlman, 1990). Other research has indicated that secondary trauma and vicarious trauma share the same symptoms and presentation, but differ in the timeframe, with vicarious trauma developing over some time and secondary trauma occurring suddenly (Best Start Resource Centre, 2012).

As it pertains to burnout, the literature suggests that these constructs are related, with burnout and secondary trauma/vicarious trauma existing on a continuum in which burnout increases the risk of developing secondary/vicarious trauma (Cieslak et al., 2014; Salloum, Kondrat, Johnco, & Olson, 2015; Shoji et al., 2015). Taken together, the similarities and differences found in the research make sense from a neurophysiological perspective. Trauma-

related conditions, such as PTSD, are related to a stress process, which would explain why research seems to find burnout, secondary trauma, vicarious trauma, and compassion fatigue as being related constructs. Differences in these constructs may be accounted for by the type of stress process that contributes to each. Trauma-related stress responses are characterized by sharp and sudden elevations in cortisol during the initial experience of trauma and shortly thereafter (Dekel, Ein-Dor, Rosen, & Bonanno, 2017; Miller et al., 2007; Pacella, Hruska, Steudte-Schmiedgen, George, & Delahanty, 2017; Weston, 2014), which sensitize the HPA axis and lead to blunted levels of cortisol beyond the acute phase, explaining the development of hypocortisolism (Lovallo, 2015, Miller et al., 2007; Pacella et al., 2017; Steudte-Schmiedgen, Kirschbaum, Alexander, & Stalder, 2016). This cortisol profile is different from a chronic stress response, in which cortisol elevates gradually and reduces steadily over time (Miller et al., 2007). Contextually, it appears that trauma-related stress responses differ from chronic stress responses in the level of perceived controllability, with uncontrollability being associated with a trauma-related response (Lovallo, 2015; Miller et al., 2007). Overall, the term compassion fatigue appears to capture the chronic stress process of burnout and the trauma-related stress response of secondary trauma/vicarious trauma, which also makes sense considering that compassion fatigue is thought of as consisting of burnout and secondary trauma (Allsbrook et al., 2016; Frey et al., 2018; Hopwood et al., 2018; van Mol et al., 2015). From a broad perspective, these terms all capture a stress process. The distinction appears to be the context in which the stress process occurs. When considering a framework that includes the chronic stress 'burnout' process and trauma-related stress responses, burnout, secondary trauma, and vicarious trauma are "indistinguishable concepts" (Cieslak et al., 2014).

Addressing Inconsistencies in Burnout Research

The previously reviewed literature appears to address several inconsistencies found in burnout research regarding the validity, dimensionality, and context of the construct. Burnout both does and does not appear to be valid and distinguishable, depending on the perspective. If referring to burnout as a condition, it appears to be closely related to, if not wholly interchangeable with depression. In this case, using burnout to represent a distinct construct may be redundant. If referring to burnout as a condition in the specific context of trauma exposure and symptomology, it appears to be closely related to PTSD. Again, using burnout to represent a distinct construct may be redundant. Considered together, neither depression nor PTSD appears to capture the presence of the other, which leaves individuals who experience symptoms of both a chronic stress and a traumatic stress process unaccounted for.

Further complicating matters, if referring to burnout the process, it appears to essentially refer to the progression of allostatic adaptation, which would not be captured by either depression or PTSD but would likely lead to the development of depression. Research indicates that the more severe burnout becomes, the more it overlaps with depression (Bauernhofer et al., 2018). Because of the number of possible perspectives, it makes sense that there has been such inconsistency in validating burnout as a distinct and necessary construct.

The dimensions that constitute prevalent burnout conceptualizations appear arbitrary, non-inclusive, and would likely explain why there is inconsistency in the literature regarding how many dimensions burnout consists of and which they are. Central to the prevalent conceptualizations of burnout, exhaustion is expected to be a central component of the construct regardless of the perspective taken. The neurophysiological changes associated with the stress response would negatively impact sleep and energy, accounting for the exhaustion aspect of

presentation. Research indicates that changes in sleep and fatigue are significant predictors of burnout, with cortisol dysregulation contributing to sleep disturbances and sleep disturbances precipitating the development of fatigue (Chiu et al., 2015).

Personal accomplishment and self-efficacy appear likely to be negatively influenced by the process of allostatic adaptation. Considering the negativity bias that can develop, it would make sense that an individual would develop a change in how effective they perceive themselves. One possible explanation for inconsistencies in personal accomplishment as a dimension of burnout might be that the negativity bias is not a guaranteed outcome of a chronic stress process and might be accounted for by individual differences. In the same way that an individual with depression might not be expected to exhibit every symptom associated with depression, an individual experiencing burnout might not necessarily exhibit every possible associated dysfunction.

Individual differences might also account for inconsistencies related to the depersonalization/cynicism dimension. The neurophysiology of chronic stress indeed suggests that cynicism can develop, empathy can diminish, relationships can be negatively impacted, world views can be changed, and isolation and withdrawal might arise. These possible changes could account for the depersonalization/cynicism dimension, but, like the negativity bias, it might not be a central component of the chronic stress process and therefore not seen in all cases and not expressed in the same manner.

As far as dimensional progression, it would appear that none of the dimensions causes another per se. Instead, the dimensions are caused by the same overarching process, with exhaustion being a central consequence and the other dimensions being secondary consequences that are more dependent on individual differences and context. As such, it would appear that

depersonalization/cynicism does not necessarily represent an active coping strategy in response to exhaustion and is better represented as a potential consequence of the more extensive process. Recent research indicates that exhaustion is the starting point and leads to depression (Aliyeva, 2018; Bauernhofer et al., 2018; Kanthak et al., 2017; van Luijtelaar et al., 2010), but there is no guarantee that depersonalization/cynicism or reduced self-efficacy would develop along the way.

Regarding context, it appears that burnout is and is not specific to people-work and is and is not specific to the occupation. The neurophysiology of a chronic stress response would suggest that individuals in occupations that do not involve human service can still experience the negative recursive process associated with allostatic overload. On the other hand, it appears that the trauma-related aspects that can be present in burnout are specific to human service work. Burnout can be considered occupation-specific in the sense that the chronic stress process occurs in the context of the occupation and is primarily related to stressors specific to the occupation. However, when considering the stress process and the impact that perceived resources and demands have on appraisals and the progression of allostatic adaptation, it would be a mistake to say that burnout only pertains to variables within a workplace and only presents itself in a work environment.

Proposed Definition and Model

With the conclusion of the reviewed literature, the final task is to apply the findings to propose an integrated definition and model of burnout. As it currently stands in the literature, burnout is conceptualized as both a process and a condition. The neurophysiology of the chronic stress process suggests that burnout should not be considered a standalone condition because once burnout reaches the point where the symptomology becomes significant, burnout is no

longer distinguishable from depression. As such, a proposed conceptualization of burnout that frames the phenomenon as a process would likely serve to best capture the construct.

Regarding issues related to dimensionality and context, there are several implications from the reviewed literature. It appears that exhaustion is a central component of the burnout process, while depersonalization/cynicism and reduced personal accomplishment/self-efficacy may or may not be symptoms that present during the progression of burnout. Furthermore, it appears that while exhaustion is likely to occur first, there is not a specific order in which symptoms progress.

Regarding context, it would appear that burnout as a stress process is not exclusively a human service-related condition. The chronic stress process can occur in other contexts that do not involve people-work per se. Beyond that distinction, it would appear that burnout can impact an individual outside the scope of work. However, it does not seem particularly helpful to broaden the conceptualization of burnout to include all other life domains, as the construct would blur with general distress and depression. It does seem helpful to include non-work-related activities as a source of the chronic stress to account for burnout in parents and students. As such, when referencing "occupation" or "occupational," the broadest definition of "an activity in which one engages" (Occupation, n.d.) appears to be the most inclusive without extending to every aspect of an individual's life. Furthermore, utilizing the definition of "work" that refers to "activity in which one exerts strength or faculties to do or perform something" (Work, n.d.) would best capture any non-employment-related activities that can be associated with burnout. This distinction is necessary since "work" and "occupation" tend to be used interchangeably when discussing burnout, and it is more efficient than trying to introduce additional terminology.

The potential trauma component associated with burnout complicates matters. While the research suggests that compassion fatigue, secondary trauma, and vicarious trauma are related to burnout and a stress process (Cieslak et al., 2014; Devilly et al., 2009), the general conceptualization of burnout does not typically include trauma-related symptomology. One possible explanation is that these conditions fall on a stress continuum in which chronic stress accounts for burnout, and more acute stress (i.e., trauma) accounts for secondary trauma and vicarious trauma. Compassion fatigue would appear to be the middle ground in that case, capturing both a chronic stress process and the trauma elements of secondary and vicarious trauma. It may be that research on compassion fatigue captures individuals who fall below the severity threshold of an acute traumatic stress response that would result in symptoms consistent with posttraumatic stress disorder, but who nonetheless follow a continuous stress process as a result of being continually exposed to sub-threshold trauma. Conceptually, the trauma component appears to align with the harm/loss subcategory of the cognitive appraisal model. It is possible that secondary trauma/vicarious trauma are related to harm/loss responses, while burnout is better accounted for by threat responses. In this case, compassion fatigue could potentially represent a process by which the individual experiences both harm/loss and threat responses of significant intensity, frequency, and duration.

As it regards a definition of burnout, there appear to be a few options for addressing the trauma issue. One option might be to consider burnout as the larger construct representing the general allostatic process which includes a chronic and acute stress continuum, with the other constructs falling under the burnout umbrella. By considering burnout as representing the general allostatic process, it would better capture how the term tends to be utilized by the general public and research as a wearing down of the individual over time. Furthermore, it would allow

the other constructs to be consolidated within the burnout construct. One downside to this approach would be that burnout as an umbrella term would then consist of the more acute trauma-related responses, which is not consistent with how the general public and research has tended to utilize the term. Another downside to this approach is that general (i.e., non-human-service-specific) occupation-related distress would no longer have a term for itself, while trauma-related occupational distress would still be accounted for. That might lend itself to the inclusion of another term, such as occupational exhaustion, which would further complicate this area of research.

It may seem plausible to conceptualize burnout as the more extensive condition, with the other constructs considered as subsets representing different contexts and presentations of the same condition. However, research appears to suggest that the trauma-related presentations can exist without symptoms typically associated with burnout (Shoji et al., 2015). This suggests that the trauma-related conditions would not be adequately represented as falling under a burnout designation unless burnout was reconceptualized as representing the entire spectrum of acute and chronic stress responses. If burnout is considered most closely related to depression and secondary/vicarious trauma is considered most closely related to PTSD, then this option would be the equivalent of saying that PTSD is a subtype of depression, which does not fully capture the condition, despite both being considered stress-related (Arnsten et al., 2015; Bianchi et al., 2015b; Cranston, 2014; Orosz et al., 2017; Schonfeld, & Laurent, 2014; Lovallo, 2015).

The final option, mentioned earlier, would be to consider burnout as falling on an allostatic continuum that would include chronic stress responses characteristic of traditional views of burnout and acute stress responses characteristic of secondary/vicarious trauma, with compassion fatigue representing the overlap between the constructs. The benefit to this option is

that it does appear to capture the allostatic process and account for the similarities and differences found in research regarding these constructs. One disadvantage to this option is that it adds another layer to an already crowded field of terms by necessitating an umbrella term to describe the continuum. This option might present challenges to the effort of integrating and consolidating constructs. Furthermore, having a continuum that includes process-related constructs such as burnout and more condition/state-related constructs such as secondary/vicarious trauma may add an additional layer of complexity to an integrated model if not adequately addressed. With that being said, the research appears to best support this option. As such, a definition of burnout would likely best capture the construct by focusing on the chronic stress response, while differentiating itself from other work-related constructs that involve more acute traumatic stress responses.

When considering the review of the literature to this point, an integrated and comprehensive definition of burnout would be as follows: Burnout is an occupational distress process by which adaptation to chronic work-related distress causes progressive neurophysiological dysregulation. The neurophysiological dysregulation results from and is maintained by iterative stress appraisals that increase the perception of demands and decrease the perception of available resources. Burnout initially presents as exhaustion and can negatively impact an individual across intrapersonal, interpersonal, and extrapersonal domains. As the burnout process progresses, symptoms increase in severity and can ultimately lead to the development of depression. This definition includes the shared elements of prevalent burnout models, explicitly implicates a chronic stress process, and utilizes a framework that emphasizes the perception of resources and demands, which is central to not only the conceptualization of burnout models but also to the neurophysiological process of chronic stress.

This proposed definition captures the neurophysiological process underlying the burnout construct. With a non-arbitrary framework established, a comprehensive, integrated model can be constructed. Based on the review of literature, it would appear that there are two elements necessary for a useful model. The first and most crucial element of the model would be the actual chronic stress response, detailing the process beginning with the potential stressor(s) and ending with the potential progression to depression. The second element of the model would provide a conceptual structure for categorizing the presentation of burnout.

When considering the chronic stress response, a significant issue appears to present itself. If the model only captures the negative aspects of the stress process, it does not adequately integrate the reviewed literature regarding positive aspects of stress adaptation. If the positive aspects of stress adaptation are to be included in a burnout model, it appears that the perspective and framework of the model must shift. Rather than presenting a model of burnout with other aspects of the stress response added on at the end, the model should focus on the larger general stress response. As such, the proposed model can no longer be considered a burnout model. The proposed model will be a stress model that highlights burnout as one potential pathway.

The starting point of the proposed model would begin with the potential stressor stimulus. Factors that might be relevant to consider would be the context of the stimulus such as novelty, urgency, frequency, duration, and intensity (Ganzel et al., 2010; Moors & Scherer, 2013; Sandi & Pinelo-Nava, 2007; Schoenle, Zimmer, & Vitousek, 2018). The stimulus context and individual differences would likely account for some of the variations seen in the presentation.

Following the initial presentation of the potential stressor, the stimulus is detected through sensory channels, and the information is processed. This portion of the model would include critical variables that have been implicated in the information processing progression, including attention, memory, learning, and previous experience (Lovallo, 2015).

The remaining components of the model would capture the allostatic process of a chronic stress response. After the stimulus and the personal characteristics would come the appraisal process, which would be influenced by the previous components and would consist of an automatic "low-road" component and a conscious "high-road" component. The overall appraisal consists of determining whether the stimulus is a threat, the potential impact the stimulus might have, and the ability to respond to the stimulus if it is appraised as a threat. The appraisal process will be separated into primary and secondary appraisals, with the understanding that they do not necessarily occur in sequence and they can both influence each other. The primary appraisal assesses the personal importance of the stimulus and the potential effect the stimulus might have on one's well-being. If the stimulus is judged to be irrelevant, no response is needed. If the stimulus is judged to be potentially harmful, a stress response occurs. If the stimulus is related to future harm, a threat response will occur, whereas a stimulus related to harm that has already occurred would indicate a harm/loss response. A challenge response will occur if there is some risk of harm, but also a potential for growth or benefit. Variables associated with primary appraisals might include novelty, emotional salience, relevance, alignment with goals, and meaning (Ganzel et al., 2010; Moors & Scherer, 2013).

The secondary appraisal would assess the overall ability to respond to the demands of the would-be stressor, the ability to influence outcomes, and coping options. This portion would include variables associated with secondary appraisals such as estimated outcomes, coping

efficacy, controllability, implications, causality, predictability, and certainty (Matthieu & Ivanoff, 2006; Moors & Scherer, 2013; Sakakibara & Endo, 2016). Arguably the most crucial aspect of secondary appraisal, perceptions of resources and demands would also be included. Resources can refer to individual skills, supports, tools, or access to work-related assets. The Job Demands-Resources Model (Bakker & Demerouti, 2006) states:

> Job resources refer to those physical, psychological, social, or organizational aspects of the job that either/or: (1) reduce job demands and the associated physiological and psychological costs; (2) are functional in receiving work-related goals; (3) stimulate personal growth, learning, and development. (Schaufeli & Bakker, 2004, p. 296).

Resources do not have to be considered within the confines of work, however. They can refer to a variety of aspects of an individual and the individual's life outside of work. Based on the neurophysiology of the stress process, it would be reasonable to generalize resources to include any aspects of the individual, as well as the individual's social support system, environment, and/or circumstances that can be perceived to either increase the individual's perceived ability to successfully navigate the stressor or decrease the threat or importance of the stressor. That might include one's general sense of competence, personality traits, self-efficacy, worldview, interpersonal relationships, and so on.

For the purposes of this model, demands should be conceptualized similarly. Demands can refer to characteristics of the stressor such as novelty, predictability, and level of control, which can influence how a stressor is experienced (Oken, Chamine, & Wakeland, 2015). Regarding demands, the Job Demands-Resources Model states:

> Clearly, in every job something has to be done. More specifically, we refer to job demands as those physical, psychological, social, or organizational aspects of the job that require sustained physical and psychological (i.e., cognitive or emotional) effort and are therefore associated with certain physiological and/or psychological costs. Although job demands are not necessarily negative, they may turn into job stressors when meeting those demands requires high effort and is therefore associated with high costs that elicit negative response such as depression, anxiety, or burnout. (Schaufeli & Bakker, 2004, p. 296).

While Schaufeli & Bakker (2004) acknowledge that demands can refer to more than just the actual job task or challenge that has to be met, they restrict demands to a work-only context. Similar to resources, the neurophysiology of the stress response would suggest that appraisals consist of consideration of a broad range of demands. Lending support to this notion, research indicates that appraisal of personal resources influences an individual's perception of job resources and job demands (Grover, Teo, Pick, Roche, & Newton, 2018; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007).

Once the appraisal process is completed, if the appraisal is that the stressor is a significant threat or that there are insufficient resources to manage the stressor, the response phase would take place. The response component of the model would include the primary components of allostasis, including the allostatic response prediction, central allostatic accommodation, and peripheral allostatic accommodation. The allostatic response prediction would account for the anticipatory nature of the allostatic process. Central allostatic accommodation would account for the activity in the previously reviewed core emotional regions of the brain. Peripheral allostatic accommodation would account for the subsequent arousal and regulatory process that occurs, as

well as the metabolic, immune, cardiovascular, neuroendocrine, and inflammatory processes. The response component would also include general products of the stress response including emotions, thoughts, coping strategies, behavioral responses, and performance. Next, the actual resolution of the stress response would occur, which would influence and be influenced by allostatic load and may not occur in the case of chronic stress. The failure to achieve stressor resolution can have significant adverse effects on all phases of the stress process (Brennan, Schutte, & Moos, 2006; Brosschot, 2010; Brosschot, Pieper, & Thayer, 2005; Witzel, Stawski, & Chandler, 2018). Finally, the response phase would include reappraisal, which can be automatic as is implied in the Lazarus & Folkman model (1984) but can also include the more effortful "high-road" appraisal that the individual makes of the stressor and how they were able to cope with the stressor.

Following the response phase, the model would then move to the consequence phase. The consequence phase would include the endpoints of the allostatic continuum, with either effective or ineffective adaptation. In the case of ineffective adaptation, the progression would move to allostatic overload, then eventually the allostatic tipping point. Following the tipping point, would be symptom development, which would include sleep disturbances and fatigue as the primary symptoms and the other previously reviewed personal factor symptoms as potential secondary symptoms. As dysregulation progresses in the model, exhaustion would come next, followed by lasting dysfunction. On the other end, effective adaptation would ideally lead to resilience, recovery, and potentially resistance. Potential reappraisal would also be included in the consequence phase.

The model would then capture the iterative nature of the process. The effectiveness of adaptation would shape subsequent stress processes, including low-road appraisals. Negative consequences would lead to changes in attention and stimulus detection, as the individual would be more sensitive to perceiving threats. This attentional bias toward threat and negativity would be compounded by shifts in the appraisal process whereby perceived resources become fewer and perceived demands become more considerable. Based on the neurophysiological process that occurs, the conscious and effortful appraisals that can help prevent negative spirals would become less and less likely to occur as executive functioning diminishes. As appraisals shift in favor of demands over resources, subsequent responses would also shift, potentially leading to more negative consequences. This would be where symptoms would begin to present as the neurophysiological changes begin to impact the individual's thoughts, feelings, behaviors, relationships with others, and the individual's relationship with the job and organization itself. At some point, if the process continues along this negative progression of dysfunction, an individual would be expected to develop exhaustion and eventually symptoms consistent with depression.

At the end of the model would be outcomes. Outcomes would include adverse occupational-related outcomes such as disengagement, vicarious/secondary trauma, and compassion fatigue. Conversely, the model would also include positive occupational-related counterparts such as engagement, compassion satisfaction, and vicarious resilience/posttraumatic growth. The model would include depression as a potential endpoint in the allostatic overload process and well-being as a potential endpoint in the effective adaptation process.

The final step in developing this integrative model is to identify the dimensionality of the burnout construct. The progression of the model has already been established as non-arbitrary based on what the literature indicates about the chronic stress process. In order to avoid the arbitrary assignment of dimensions, it appears that the model would be best served by utilizing domains and applying them to the different phases of the model. To promote a more diverse representation of people and avoid the pitfall of hunting for symptoms, problem types, or diagnoses, domains allow for a broader portrait of functioning. Fortunately, the domains have already been identified during the review of burnout literature and appear to be substantiated by the neurophysiology of the chronic stress process.

When reviewing the proposed model, the three personal domains – intrapersonal, interpersonal, and extrapersonal – can all be applied to the appraisal, response, consequence, and outcomes phases. This approach is advantageous for several reasons. This approach can capture the nuances of different chronic stress presentations, encapsulate the strengths of already-established burnout conceptualizations, and eliminate the arbitrariness of dimensions that have been suggested in the literature. Moreover, this approach provides a shared framework for not only identifying elements of the burnout process, but it can also provide a comprehensive and straightforward structure to apply assessment, treatment, and prevention efforts.

Intrapersonal factors, interpersonal factors, and extrapersonal factors would be included along with stimulus context as variables that likely account for individual differences seen in burnout presentation. Intrapersonal factors would likely include variables that have been found to influence burnout presentation such as age, gender, race, experience, socioeconomic status, education, empathy, self-esteem, and personality factors (Bakker & Costa, 2014; Brazeau et al., 2010; Canadas-De la Fuente et al., 2015; Hakanen, Bakker, & Jokisaari, 2011; Skinner,

Shirtcliff, Haggerty, Coe, & Catalano, 2011; Tarcan, Hikmet, Schooley, Top, & Tarcan, 2017; Thirioux, Birault, & Jaafari, 2016; Thomas et al., 2014; Vladut & Kallay, 2010; Zilioli, Imami, & Slatcher, 2017). Interpersonal factors would include relational variables that have been implicated as influential to the burnout process such as social skills, social support, recipient (or client, patient, customer, etc.) interactions, trauma exposure, relationship status, and supervision (An et al., 2013; Aronsson et al., 2017; Canadas-De la Fuente et al., 2018; Gomes, Simaes, & Dias, 2017; Livni, Crowe, & Gonsalvez, 2012; Moreno-Jimenez, Galvez-Herrer, Rodriguez-Carvajal, & Sanz Vergel, 2012; Sullivan, Kondrat, & Floyd, 2015; Thirioux et al., 2016). Finally, extrapersonal factors would include primarily organizational variables associated with burnout research such as workload, fairness, job security, reward, sense of community, values, and feedback (Aronsson et al., 2017; Bakker, Boyd, Dollard et al, 2010; Brooks et al., 2019; Thirioux et al., 2016).

Refer to Figure 1 for the full, comprehensive visual depiction of the proposed stress model. Figure 2 provides a simplified overview of the proposed model for ease of viewing and general application. The figures provide a framework for positive and negative pathways of the stress process, with positive aspects in green and negative aspects in red. The red pathway in the figures essentially captures the burnout process.

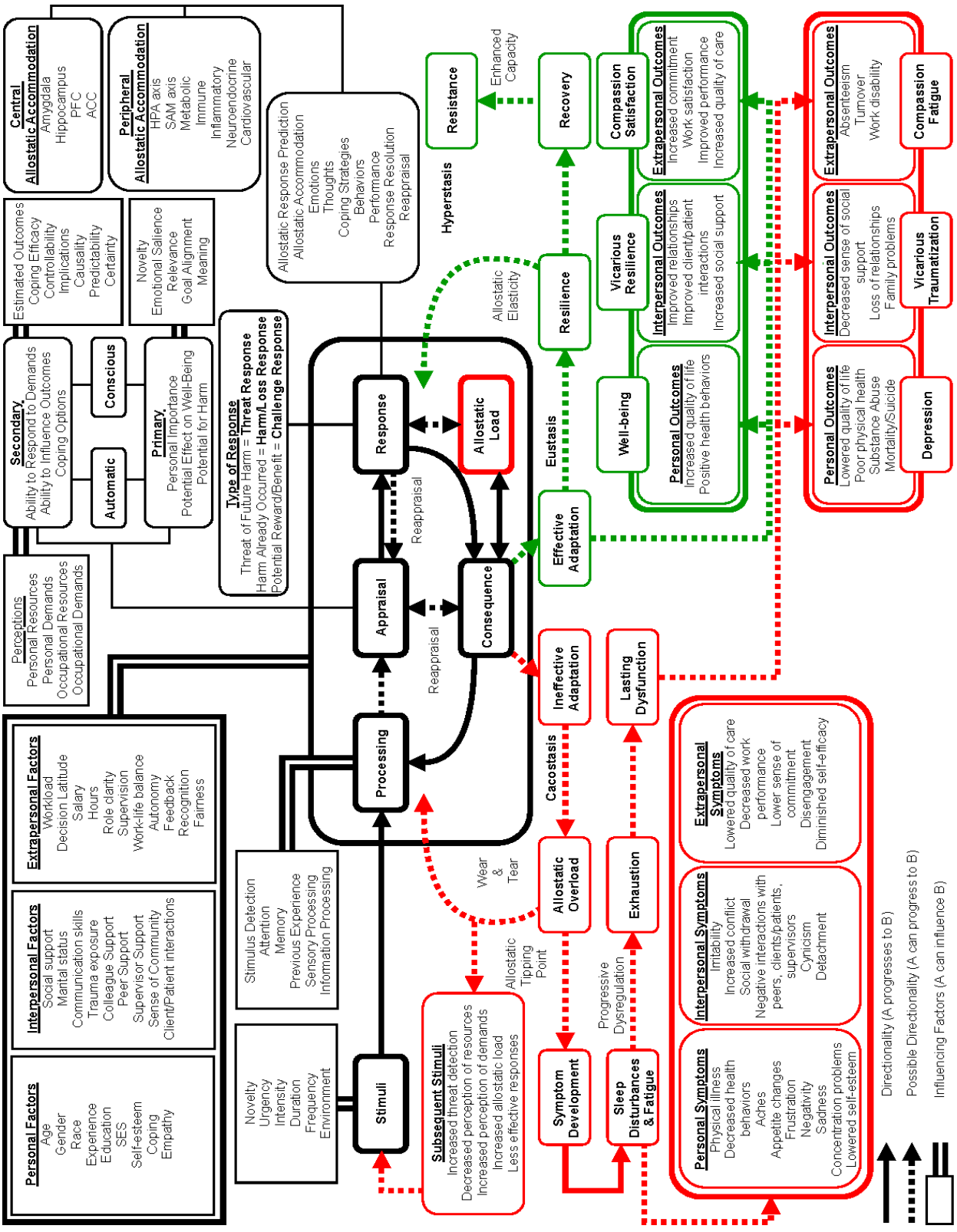

Figure 1. Comprehensive stress model. The red pathway represents burnout.

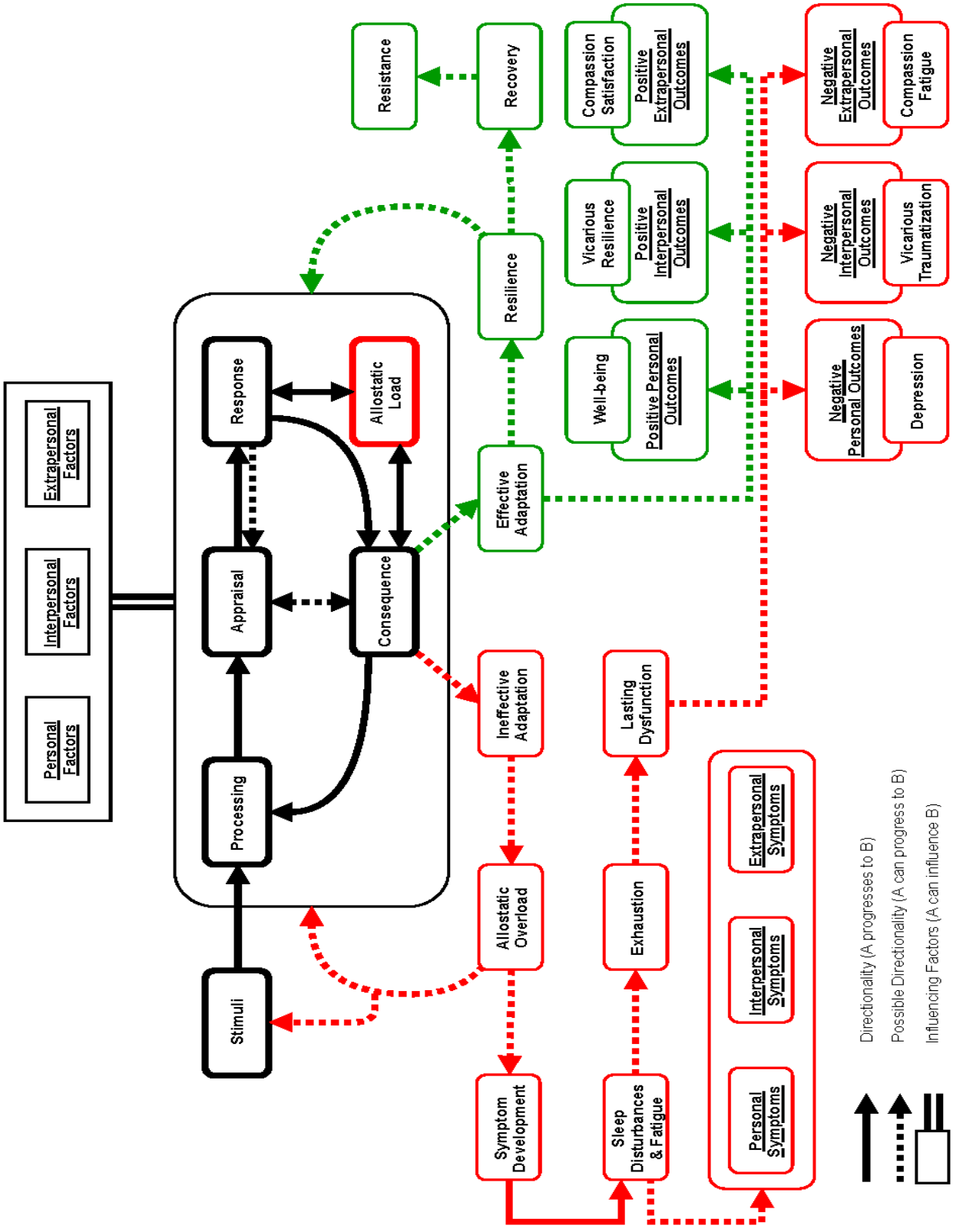

Figure 2. An overview of the proposed stress model. The red pathway represents burnout.

CHAPTER VI: DISCUSSION

Summary

The purpose of this study was to explore the burnout and stress literature to identify a potential framework for a better understanding of the concept of burnout. In reviewing the burnout literature, it is clear that burnout research has been mostly flawed to this point. Inconsistencies in definitions and conceptualizations have hindered the development of the construct. The description of burnout as both a process and a condition has contributed to significant ambiguity within the literature. Furthermore, it appears that the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981, 1986) has become the standard assessment tool for burnout primarily due to the lack of other options at the time it was developed. Despite several significant criticisms regarding methodology, underlying theory, and utilization, the MBI continues to be the default measure and, subsequently, the definition of burnout. Unfortunately, it does not appear that research has identified any superior alternatives. Conceptually, burnout models have been criticized for arbitrarily assigning dimensions, providing varying definitions, and failing to distinguish burnout from other conditions such as depression.

In this review, the prevalent models of burnout were reviewed in order to identify possible commonalities among conceptual elements. The findings indicate that all models frame burnout as related to a stress process. The reliance on the stress process has been peculiar in burnout research to this point, mainly because none of the prevalent models has utilized the abundance of stress-related research to provide an empirically based framework. Another commonality found among burnout models is the utilization of a resources and demands framework, whereby burnout results from some chronic imbalance between an individual's perceived resources and perceived demands. Finally, all prevalent models of burnout include

factors across three personal domains. The intrapersonal domain pertains to factors inside individual and includes mental, physical, and behavioral aspects. The interpersonal domain pertains to relational aspects between the individual and clients, co-workers, and supervisor. The extrapersonal domain pertains to factors outside of the individual, particularly as it relates to the individual's relationship with their occupation, organization, and environment. These domains are general and broad but appear to capture the full range of diverse presentations associated with burnout. The domains can be utilized to capture not only symptoms, but also resources, demands, responses, and outcomes.

The stress literature appears to provide a clear picture for the process and progression of burnout. The basic stress process for individual stressors consists of the perception and processing of the stimuli, an appraisal of the threat level of the stimuli (demand) as well as the ability to effectively respond to the threat (resources), and finally, a response consisting of arousal, regulation, and resolution. The response also includes products of the stress process including emotions, thoughts, behaviors, and reappraisals. By itself, the individual stress response does not fully account for burnout, which is where the concept of allostasis comes in. The allostatic process of predictive responding, neurophysiological accommodation, and adaptation creates the potential for individual stress responses creating wear and tear to the individual over time, decreasing their ability to respond to subsequent stressors effectively. When adaptation is ineffective, cortisol levels become elevated, which contributes to neurophysiological alterations, specifically in core emotional regions of the brain, including the amygdala, hippocampus, PFC, and ACC. These alterations attempt to help the individual adapt to a stressful environment, but over time the adaptations become deleterious, leading to allostatic overload, symptom development, and exhaustion. Exhaustion appears to take place through

disruptions to circadian rhythm, specifically diurnal cortisol slopes, which negatively impact the quality and quantity of sleep as well as overall energy levels. The iterative nature of the chronic stress process creates a negative cascade in which ineffective individual stress responses lead to a decrease in perceived resources and an increase in perceived demands. This cascade contributes to alterations in the stress response, including adverse effects on emotions, thoughts, and behaviors. As the stress response spirals from ineffective adaptation to overload and exhaustion, the individual may experience other interpersonal and extrapersonal symptoms. Taken together, this progression effectively captures the burnout process. Ultimately, this process continues in its progression until the individual develops depression.

Regarding inconsistencies in the literature, the review of burnout and stress research appears to provide several potential explanations. While burnout has been used to describe a condition and a process, the stress research appears to support burnout being a process. Burnout appears to be different from depression, but burnout is likely to be a process by which an individual can develop depression.

The stress literature appears to provide some distinction between burnout and other conditions. Compassion fatigue and secondary/vicarious trauma include a trauma-exposure component, which is not found in the burnout process. Both compassion fatigue and secondary/vicarious trauma appear to be conditions that can develop quickly, while burnout is indicated as a progressive dysfunction over a more extended time period. Secondary/vicarious trauma appears to be closely related to PTSD and may be the result of not only trauma-exposure but an intense acute physiological response as a result of trauma-exposure. Compassion fatigue may represent the middle ground between secondary/vicarious trauma and burnout.

In terms of dimensionality, the stress process supports the development of exhaustion as central to burnout. The other dimensions of cynicism and reduced personal accomplishment appear to be secondary symptoms that are part of the burnout process, but not necessarily required. In the same way that depression does not look the same for everyone, individuals experiencing the process of burnout may or may not exhibit a variety of symptoms associated with long-term neurophysiological dysregulation and dysfunction.

When reflecting on the burnout and stress literature, it does appear possible to establish an integrated and comprehensive definition of burnout. Based on the neurophysiology of the chronic stress process, allostasis, and the shared conceptual elements of common burnout definitions, burnout is best defined as an occupational distress process by which adaptation to chronic work-related distress causes progressive neurophysiological dysregulation. Furthermore, the dysregulation appears to result from and is maintained by iterative stress appraisals that increase the perception of demands and decrease the perception of available resources. Regarding presentation and progression, burnout initially presents as exhaustion and may manifest in other symptoms across intrapersonal, interpersonal, and extrapersonal domains. As the dysregulation progresses, symptoms become worse and ultimately lead to depression. Of note, in this case, the words "occupational" and "work-related" refer to the definitions that are activity-based, not necessarily employment specific.

With a research-based framework, an integrated model can be constructed, with one significant caveat. In order to be a fully integrative model, the model cannot be considered a burnout model; it must be considered a stress model, with burnout as one potential pathway. Based on this framework, the integrative model looks as follows: (a) stimulus context and (b) personal factors (intra, inter, and extra) influence all subsequent steps in the process. The

stimulus (a) is (c) detected and processed, leading to the (d1) primary appraisal process where the importance and impact of the stimulus are evaluated. The (d2) secondary appraisal assesses the ability to respond to the demands of the stimulus, the individual's perception of resources and demands, coping options, potential outcomes, and the ability to influence outcomes. Once the stimulus is identified as a stressor, the (e) response phase begins, which includes the allostatic response prediction, central and peripheral allostatic accommodation, the resolution to the response, and emergent emotions, thoughts, coping strategies, and behaviors. Following responses come (f) consequences, which consists of a range of effective or ineffective adaptation. Outcomes (g) come next and represent the continuum of positive and negative conclusions of the process across (b) the personal factor domains. The iterative nature of the process is captured as (f) influences subsequent occurrences of (c), (d1), (d2), (e), and (f), with the initial progression repeating until (g) is reached. The burnout process is captured through the process of ineffective adaptation in (f), where allostatic overload leads to symptoms, including at least sleep disturbances and fatigue, with the potential for other symptoms across the personal factor domains. The progressive dysregulation leads to exhaustion then lasting dysfunction, which is followed by adverse outcomes across the personal factor domains, including depression.

Clinical Implications

The proposed definition of burnout and stress model presented here have numerous clinical implications. According to Manzano-Garcia & Ayala-Calvo (2013), "the construct of burnout needs to be integrated into true theoretical approaches that allow us to discover the underlying laws and processes" (p. 806). Based on the review of burnout literature and the chronic stress process, it appears that the presented conceptualization of burnout is integrated, includes true theoretical approaches such as appraisal theory and allostasis, and is based on

underlying neurophysiological processes. The presented integrated approach to burnout may provide a way to focus future research by providing researchers with a non-arbitrary, neurophysiologically-based foundation to build upon. This model appears to address inconsistencies in the literature and distinguish burnout from other conditions. Furthermore, this model resolves the issues related to dimensionality by utilizing broad domains to capture the variety of presentations associated with a chronic stress process.

In applying the proposed conceptualization of burnout, future research may be better able to predict, assess, prevent, and treat burnout. This conceptualization of burnout allows for better prediction of burnout as risk factors can begin to be focused upon. Rather than asking individuals if they are "burned out," we can look at specific areas of functioning across the three identified personal domains to identify possible risk. If the research indicates that perceptions of social support reduce the risk for burnout and the development of associated conditions, then information can be gathered on how individuals perceive their current social supports. This allows for predictions to be made based on the presence or absence of specific resources and demands.

Assessment efforts can also be improved with this proposed conceptualization of burnout. By utilizing what is known about the stress process currently, burnout can be assessed through more objective methods such as allostatic load, cortisol levels, and brain imaging. Subjective measures, such as self-report assessments, can also be improved. By shifting the focus from abstract and arbitrary dimension-based questions, measures can assess factors associated with burnout. For example, measures can assess specific appraisals, behaviors, perceptions, interpersonal interactions, thoughts, and emotions to better capture the underlying mechanisms that contribute to the burnout process.

With a better understanding of the underlying stress process that drives burnout, prevention efforts may improve. If burnout can be better predicted and assessed, it can be more effectively prevented. Using what is known about the chronic stress process, risk factors can be identified across the three personal domains to create effective preventative measures for the individual, for co-workers, and organizations.

Finally, by integrating the stress research and burnout literature, intervention efforts become more effective. Rather than two separate fields of research attempting to find effective treatments, burnout research can utilize intervention methods that are supported by neurophysiological research. This model provides several areas for potential intervention. Appraisals of resources, appraisals of demands, reappraisals, and coping strategies can be addressed, providing methods for intervention at various stages of the chronic stress process. Furthermore, this conceptualization of burnout provides a comprehensive and systematic overview of the construct, which may allow for more effective delivery and psychoeducation for individuals being treated for burnout.

Limitations

There are a number of limitations to this project that should be taken into consideration. One of the most significant limitations is that this study is a literature review. While this review attempts to integrate a vast scope of research in order to develop a comprehensive model, it has not been empirically tested or validated. Further research would need to be conducted in order to test the validity and reliability of the proposed conceptualization of burnout.

The other significant limitation is that this study has attempted to map out various neural correlates as a way to substantiate the proposed burnout perspective. Any area of research that simplifies brain function, as this study has, is reductionistic. Taking such a broad approach

understates the complexity of interconnections and functions of the brain. This review cannot fully capture the magnitude of complexity or the full breadth of interconnectivity that contributes to the stress response. As such, there inevitably remain several aspects of neurophysiology that have been unaccounted for and overlooked.

Because of the complexity of symptoms, symptom presentation, and the reviewed neural correlates, some aspects of inconsistencies in burnout literature must be attributed to individual differences in the stress response. This approach is speculative and may overlook other explanations. A further empirical investigation is warranted to substantiate these speculations.

Even if this conceptualization of burnout is validated and empirically supported, it does not provide much information regarding some of the specifics of burnout. Notably, this burnout perspective does not provide any insights into how an individual makes the transition from the burnout process to the development of an associated condition. It is possible that this model has overlooked some aspect of the neurophysiological process that accounts for the individual threshold from process to condition.

Recommendations

There are several recommendations for burnout research moving forward. In order to substantiate the proposed model, additional research is needed. Longitudinal research assessing stressors, appraisal, neurophysiological responses, and symptoms would help provide evidence for the proposed stress model and definition of burnout. Research should focus on allostatic processes, with an emphasis on comprehensive measures of allostatic load. Furthermore, research needs to include a cross-cultural perspective. This proposed conceptualization of burnout is broad and does not provide detailed specifics as to potential differences in different cultures or regions. These factors are essential to explore further.

The next recommendation is for the creation and validation of an assessment measure utilizing this framework. Assessment measures should focus on specific risk factors, resources, and demands across the three identified personal domains. For the intrapersonal domain, assessments should focus on thoughts, emotions, behaviors, and physiology and health factors. For the interpersonal domain, assessments should focus on perceptions of social support, relationships inside and outside of work environments, sense of belonging, and quality/quantity of interpersonal interactions. For the extrapersonal domain, assessments should focus on perceptions of organizational support, the quality/quantity of work, pay, perceptions of work engagement, and work satisfaction. Measures could be validated by establishing specific criteria for the process of burnout (e.g., specific allostatic load factors, identified behaviors associated with burnout, and any information that provides insight into the individual's appraisal process) and comparing results of the measures to criteria. Current burnout measures such as the MBI could also be utilized as a reference point to determine how well current measures assess this specific model/definition of burnout. If current burnout measures are found to be reliable measures of this specific model/definition of burnout, then they could be utilized in conjunction with new measures to analyze and identify significant factors. Measures that identify risk for burnout and predict burnout could be used in longitudinal research to determine how effective measures are in prediction.

Finally, this model can be utilized as a framework to consolidate intervention and prevention approaches. Future research efforts should focus on gathering successful interventions across the personal factor domains. This model could be used to develop and organize prevention efforts as well as effective treatment options across domains. Future research might benefit from the development of a protocol that includes identification,

prevention, and treatment information for individuals and organizations. Overall, future research should also focus on empowering individuals and organizations by moving beyond merely identifying, assessing, and labeling. Burnout research should focus on beneficial aspects of the stress response that can promote well-being and lead to antithetical conditions, including compassion satisfaction, secondary traumatic growth/vicarious resilience, and engagement.

From an obscure literary analogy to part of the common vernacular, the concept of burnout has come a long way since the 1960s. Burnout continues to be a significant challenge for many, consuming and depleting individuals much like Graham Greene referred to when comparing the loss of zeal to cases of leprosy (1961). Burnout continues to be a topic of substantial interest across numerous fields of study, but the research has not been completely clear or consistent. The amount of progress made in effectively managing burnout is unclear, more than likely due to the problematic nature of burnout literature to this point. Moving forward, this project hopes to provide a greater understanding of burnout in order to develop a shared conceptualization of the construct. In doing so, research might spend less time and effort on examining arbitrary conceptual differences, research data might be better understood and applied, and more effective methods of prevention and intervention might occur. Burnout might have the potential to consume an individual's resources, but it is not leprosy. With an integrated neurophysiological conceptualization of burnout, as proposed in this project, burnout is no longer an ambiguous, nebulous collection of symptoms with unknown dimensionality and context. Instead, burnout is an identifiable, observable, actionable process that can be influenced at several points and across multiple domains. There is still more work to be done in order to cure this disease, so to speak, but it is clear at this point that there is no longer reason for this chronic stress process to simply be allowed to "run its course."

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